MEDICAL EXAMINATION OF SCHOOLS AND SCHOLARS

EDITED BY

T. N. KELYNACK, M.D.

University of California

Lux ex Tenebris.

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EDITED BY

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WITH AN INTRODUCTION BY

SIR LAUDER BRUNTON, BART.

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LONDON:
P. S. KING AND SON
ORCHARD HOUSE, WESTMINSTER, S.W.
1910

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PREFACE

THE adoption of the Education (Administrative Provisions) Act, 1907, marks the beginning of a new era in regard to the health of the nation. By this measure the School Hygiene Movement attains partial fulfilment. That systematic medical examination of the school children of the country was urgently needed has been abundantly testified in Dr. George Newman's epoch-making first annual report as Chief Medical Officer of the Board of Education and by the records of school doctors in all parts of the land. The establishment of a School Medical Service marks but the beginning of progress. The Medical Examination of School Children is to be viewed and dealt with as a means to an end—the rearing of healthy citizens. The recognition of derangements and deficiencies must be followed by scientifically directed efforts for rectification and the establishment of reliable measures to secure the prevention of all disorder and disease in early life.

The aim of this work is essentially a practical one. It seeks to provide a complete guide for school medical officers, and to afford educationalists and all interested in the welfare of the school child with a reliable and authoritative exposition of the methods and means whereby the best use may be made of the machinery at present available. Whilst the problems of school hygiene have been discussed in their widest relationships, an endeavour has been made to provide detailed consideration of all such subjects as are concerned with efficient administration and organisation. Questions of merely academic interest and temporary importance have received only limited attention, but to the consideration of principles of permanent value much space has been given.

The volume is unique in that it presents the experience and views, in as concise and convenient a form as could be arranged, of no less than thirty-six different contributors. The subject of the medical examination of school children has already reached such dimensions that no one person can hope to provide a complete description of all matters concerned with the conduct of an efficient School Medical Service. The various chapters of this volume have been contributed by those who have won the right to be recognised as experts. Each writer has been allowed a free hand in the expression of his or her own opinions, and must of course be considered as responsible only for the chapter contributed.

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It is impossible to acknowledge adequately the valuable services of the many who have assisted in the preparation of this work. To Sir Lauder Brunton, the Editor's best thanks are due for his interest and encouragement and for the suggestive introduction. To each and all of the contributors unbounded thanks must be accorded, for without their ready co-operation this volume would not have been possible.

It is believed that the chapters contributed by our confreres in Britain Overseas, America, and the progressive countries of Europe will be of special interest and value.

Much effort has been expended to provide helpful bibliographies which will, it is hoped, be of real use to those engaged in practical service for the school child. An attempt has been made to make these references as complete as possible, and in order to increase their utility the names of publishers and prices have, wherever possible, been given. The Editor will count it a favour if he may be informed of all errors of omission and commission. It is to be hoped that some day a National Bureau of Child Welfare will provide a Library open to all workers.

In the verification of references much assistance has been most willingly rendered by Miss V. A. Nina Sawyer, the Librarian of the British Institute of Social Service, 4, Tavistock Square, London, W.C.

Mrs. E. V. Kanthack de Voss has given invaluable help in the translation of the chapters relating to Germany and Switzerland.

In the correcting of proofs and the preparation of the Indices I have been much assisted by my wife, Mrs. Violet Kelynack, M.B., Ch.B.

Finally, it is both a pleasure and a duty to acknowledge the generous assistance and practical interest of our publishers, who have in every way possible furthered the issue of the work in a manner which it is trusted may be considered not altogether unworthy of the important national subject with which it deals.

T. N. Kelynack.

139, Harley Street, London, W.
July 1st, 1910.

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MEDICAL EXAMINATION OF SCHOOLS AND SCHOLARS: AN INTRODUCTION

BY

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The adopton of manhood suffrage by the British people had compulsory education as an almost inevitable consequence, for it is absurd that a man who can neither read nor write and is therefore unable to learn about the affairs of the country should yet have an equal vote in their management with those who are thoroughly conversant with them. But voting is only one part of the duty of a citizen, and the nation is beginning slowly to perceive that unless the bodies of children are attended to, as well as their minds, they will tend as they grow up to swell the ranks of the unemployed and unemployable.

Physical training, supplemented by feeding, and, if necessary, by free food, is therefore a necessity, but it cannot be undertaken without a preliminary medical examination, because the exercise that is sufficient to develop one child might be too little for another, and far too great for a third, so great indeed as to bring about irreparable mischief instead of benefit.

The necessity for physical training has been pointed out in various Blue-books, and more especially in the Report of the Royal Commission on Physical Training (Scotland), 1903, in the Report of the Inter-departmental Committee on Physical Deterioration, 1904, and in the Report of the Inter-departmental Committee on Medical Inspection and Feeding of Children, 1905.

But in spite of these reports, which clearly pointed out what ought to be done, no action was taken. The British Medical Association again and again urged the necessity for action. It was urged also by the National League for Physical Education and Improvement, but it was the Second International Congress for School Hygiene, under the gracious patronage of His late Majesty King Edward VII., that seemed finally to stir the authorities to action, and the adoption of the Education (Administrative Provisions) Act in August, 1907, marks the commencement of an era in the history of this country. By this important legislative measure a compulsory system of medical examination of children in public elementary schools has been established, each local education authority being made responsible for its conduct.

This country was long in adopting systematic medical examination of its school children in elementary schools, but it now possesses a machinery for supervision of the physical needs of its coming citizens which, in spite of its limitations and deficiencies, is probably unsurpassed by any other country.

It is well to remember that as far back as 1891 the London School Board appointed a medical officer, and in 1893 Dr. James Kerr commenced his long service for children under the School Board of Bradford. At the passing of the Education Act, 1902, some further appointments were made, and by the time the Report of the Inter-departmental Committee on Medical Inspection and

Feeding of Children attending Public Elementary Schools (November, 1905) was issued, medical officers for educational purposes had been appointed by six counties, thirty-five county boroughs, thirty-one boroughs, and thirteen urban districts, a total of seventy-nine authorities out of 336 in England and Wales.

It is needless to enumerate all the slow steps of the progress. The history of the movement is writ clear and large in the available records. Neither is it needful now to reiterate the arguments by which the case for medical examination was won. In an address which I delivered in Manchester in 1906 I expressed the opinion that " medical inspection of children and the teaching of the laws of health in schools may increase the rates to a certain extent in one way, but it will lead to their great diminution in other respects, and it will be found ultimately that it is a great deal cheaper to spend pence on children than pounds on paupers." This is the view which now guides and governs our educational policy.

We are, however, but at the beginning of things. Medical examination of school children is still in the experimental stage. We have much to learn regarding means and measures, methods of examination and procedures preventative and therapeutic.

This volume consists of a collection of studies by experts, and provides material gathered from all sources and dealing with every aspect of the question. Its aim is to provide school medical officers, managers of schools, educationalists, and all interested in the national care of the health of our children with a complete and reliable guide to every department of medical school service.

The work has been designed on broad lines. The cause of the child is a cosmopolitan one. The chapters contributed by our foreign confrères form one of the most interesting and valuable sections of the volume. Special

features which will be appreciated by practical workers are the very full bibliographies appended to each chapter.

The medical examination of school children is but the means to an end—the development of perfect citizens.

We are still far from the perfecting of our means, but this work is an endeavour to aid in the attainment of this necessary preliminary. If the truths here exemplified are materialised into effective machinery and set to work for the protection and preservation of the life of our school children this work will not have been prepared in vain.

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I

CO-RELATION OF THE SCHOOL MEDICAL SERVICE AND THE PUBLIC HEALTH SERVICE

BY

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DURING recent years public health administration in this country has developed in a marked degree, and in many directions: steady improvement of the health of the people has been a conspicuous feature of this period. One of the most important of the newer developments has been in connection with the systematic medical examination of school children under the terms of the Education (Administrative Provisions) Act, 1907, and it is with one aspect of this important subject, viz., the co-relation of medical inspection and the service dealing with public health, that this opening chapter is concerned.

THE PUBLIC HEALTH SERVICE AND CHILD LIFE.

The Public Health Service takes cognizance of the health of the entire population, approximately one-fifth of which is comprised of school children. The great majority of these live under urban conditions. The supervision, therefore, from the health point of view of these children has always been an important part of the duty of Public Health Authorities and their officers; indeed, the health of

this section of the population has been further safeguarded by special legislation relating to children, or having their main application to school children, *e.g.*, to the exclusion—either in their own interests or for the welfare of other children in school—of scholars who are infected, or who come from infected houses; the closure of the school also is in some cases provided for. It may also be mentioned that certain fundamental sanitary principles have been followed as regards the construction of the school itself.

In other ways also the public health authorities of most towns have safeguarded the health and comfort of school children; it is amongst children that zymotic diseases are most prevalent, and it is they who constitute the bulk of the patients in the hospitals provided by public health authorities. Other obligations affecting the health and well-being of children are imposed upon public health authorities by Acts of Parliament, some of which were passed long antecedent to the Education (Administrative Provisions) Act of 1907, such as the Public Health Act of 1875, Infectious Disease (Notification) Act, 1889, Infectious Disease (Prevention) Act, 1890, the Factory and Workshop Acts, the Cleansing of Persons Act, 1897, Employment of Children Act, 1903, Prevention of Cruelty to Children Act, 1904, whilst the more recent Children Act of 1908 contains provisions which devolve upon the public health authority for their discharge.

These powers, conferred upon public health authorities regarding the child population, are not limited to those of the school age, but embrace all ages in some particulars, although in others Parliament has for some inexplicable reason refused to extend to children below or above the school age some of the invaluable measures of protection which it has granted to school children.[1]

[1] In 1907 the Corporation of the City of Liverpool promoted a Bill in Parliament, one clause of which was designed to extend to children below the school age the provisions now relating to the cleansing of verminous children, on the grounds that these children would not, in the case of neglectful parents, receive the oversight from teachers and others that those attending school must necessarily receive, and that moreover they were the most defenceless class of the community. Parliament, however, refused to extend the benefits of the Act to these children.

These powers have, in the past, necessarily brought the public health authorities into close and frequent touch with education authorities, more especially in the large centres of population. How close and how frequent can be readily ascertained by the perusal of the reports of medical officers relating to almost any district, but it may be useful to state that in one large sanitary district, viz., that of Liverpool, there were, during the three years 1905-6-7, an average of 27,000 intimations sent each year to the Education Department from the Public Health Department, chiefly relating to children from infected houses, or who were suffering from some condition requiring attention, or to some other circumstance perhaps not affecting the scholar. On the other hand an average of more than 20,000 references were received during each of those years by the Public Health Department from the Education Department, asking for certain investigations or inquiries to be made. These numerous duties incumbent upon public health authorities towards children have not sprung into existence with any recent legislation; this is merely one illustration of the closeness of co-operation and the harmonious working between two important sections of public service in the past, which has resulted in an immense amount of good; but the recent Education Act has furnished a golden opportunity to fill gaps and to remove difficulties which previously existed.

Public Health and the Examination of the School Child.

The passing of the Education (Administrative Provisions) Act, 1907, called into existence an exceedingly useful machinery to provide for a much needed systematic medical inspection of school children, commencing with the examination of those entering and leaving school, and not only that, but the re-inspection in due course of such children as were found to be defective, and still further for the due reporting of conditions in the school which the

medical inspector might ascertain at the time of his examination to be prejudicial to the health of the children.

It will be seen, therefore, that although important relations have always existed between the authority responsible for health and the authority responsible for education, yet legislation providing for this systematic medical examination has, as it was designed to do, brought the two authorities into still closer contact for the general good. It might perhaps be more correct to say the two branches of the one authority, because in urban districts, *i.e.*, the districts in which the majority of school children live, the same body—viz., town council, city council, or sometimes urban district council—forms the public health authority and the education authority, and has usually delegated its duties to appropriate committees—viz., a health committee and an education committee.

Any student of the Acts of Parliament under which action is taken, or of the Codes of Regulations relating to public elementary schools, or of the Memoranda from time to time issued by the Board of Education or by the Local Government Board relating to the subject, will easily satisfy himself that the real object of the medical examination of school children is not merely to tabulate, nor to record heights and weights, defects or physical peculiarities, nor, as has even been urged, is it primarily a disciplinary and educational measure, but the real object undoubtedly is to ameliorate the health conditions of this important section of the community, to help to safeguard it from disease, to render it more healthy, consequently more happy and more vigorous, and more receptive to the educational influences under which it is placed.

The systematic medical examination of school children being continuously carried on, the school medical officer will necessarily be absent from any particular school for a long interval when his work in that school is accomplished. During this interval the health administration of the school must fall back upon the methods in vogue prior to the passing of the Education (Administrative Provisions) Act of 1907, but fortified and improved by the information

gained by the work of the school medical officer, who would visit the school twice, or perhaps three times, in a year. In these intervals there can be no question that the medical officer of health cannot be relieved of responsibilities in regard to infection and other matters, whatever arrangements have been made by the local authority in regard to the administration of the Act. It may here be appropriate to refer, on the other hand, to the circumstance that the school medical officer may during his inspection find children in school who have recently recovered from illness, and whilst certified by the medical officer of health to be free from infection are too debilitated to resume school work. It must be borne in mind that although the child may be free from infection, and so far as the risk of infection is concerned may with perfect safety return to school, yet the child may not be sufficiently recovered physically to undertake at once the full work and discipline which attendance at school entails.

The Purpose and Methods of Co-operation.

In order to attain the maximum of benefit in these matters there must be the closest and most cordial co-operation between the two bodies charged respectively with health and with education, and the respective officers must work in unison. The arrangements, generally speaking, are simplified in the towns where a supreme authority controls both sections, and there can be very little question that additional administrative authority given to county medical officers would prove a valuable means of co-ordinating various sub-districts which the county supervises.

When the Act was passed, and shortly before it came into operation, it would seem that some difficulty which was experienced in gauging either its real scope or its probable effects, led to divergence of opinion as to whether or not the medical examination of school children should be treated as a separate and distinct branch of local administration, or whether it should be associated with existing health departments. Whilst, generally speaking, the health

authorities fully recognised their duties in regard to the child population, there were a few exceptional instances in which the health of school children whilst in the schools had already been taken in hand as a branch of work with which it was thought undesirable to burden the health department. These cases, however, were rare, and, generally speaking, the subject was open, and those who from the first recognised the real objects of the work favoured its association with existing health departments. This meant the appointment, where his administrative duties enabled this to be done, of the medical officer of health either to act as school medical officer, or to supervise the school medical officers' work if his other administrative duties rendered it difficult actually to share in the work. Usually in the urban districts, and frequently in others, the health authority had a staff available for co-operation with the school medical officer, and this, of course, was a factor in favour of unification of the office with that of the medical officer of health, a course which was ultimately adopted in the large majority of cases, approximately 224 areas out of 307 having followed it. In those districts where it was found more convenient for various reasons to appoint a separate department specially to undertake and deal with the medical examination of school children, it is interesting and satisfactory to note that, as far as can be ascertained, the efficiency is not less than it is under the other method so long as a complete degree of co-operation exists between the respective officers concerned.

The Association of Home and School Influences.

It is almost unnecessary to point out that there can be no demarcation in administration between the health of the school children or other children and the health of the rest of the population, still less in the importance of maintaining the health of the child in the school and the child in the home. The intimacy of domestic relationships makes it plain enough that there can be little if any distinction between the scholars and the little brothers and sisters at home, or those above the school age; on the other hand, if the

condition of a school child evidences parental neglect, a valuable clue is given to the necessity of a visit to the home to ascertain what the home condition is. The short cut to the dirty or neglected home is often through the school. This visit may or may not be paid by one or other of the school medical officers; probably it will more appropriately be made by other members of the medical officer of health's staff.

Home Visitation.

A still further linking up of the two departments, if such they may be called, takes place where the sanitary authority is able to allow a trained female sanitary inspector to be present at the time of examination; an inspector familiar with the district, and who in all likelihood knows some at least of the children, and who can pay a visit to any home which the school medical officer may desire a visit to be paid to. Cases of neglect, of underfeeding, and of inattention, can thus be promptly dealt with, cleansing of children procured, and many other troubles alleviated, whilst at the same time matters concerning home hygiene may receive attention. Re-visits to the homes also can be made by others than the school medical officer, with a view to ascertain what measures are taken to fulfil the directions which he has given. Tuberculous affections may be referred to the medical officer of health to be dealt with by isolation or in other ways. Cases also in which the school medical officer suspects that boys are employed beyond the legal limits out of school hours, and cases of cruelty can be referred to the medical officer of health for investigation. In cases of long continued disorder such as chronic forms of ringworm, scabies, etc., arrangements can be made whereby the patients may be kept under observation and be adequately dealt with. Among other directions in which the medical inspection of school children helps forward general sanitary administration it may be mentioned that the examination frequently reveals the whereabouts of households where the efforts of the sanitary staff can be profitably employed in cleansing

the dwelling, etc., whilst any connection between the employment of the mother and the neglect of the children is also indicated. Further, exceedingly valuable information also can be obtained as to the condition of the locality in regard to the efficiency of vaccination, so that the medical officer becomes better informed as to the outlook, in view of the introduction of small-pox into the district. Again, the conversation which the school medical officer has with the parents cannot be other than useful in inculcating some of the principles of hygiene, which will be carried home, and, it is hoped, acted upon.

General Conclusions.

The above are some of the many considerations which indicate the value of co-operation between the Public Health Service and the newly-constituted School Medical Service, and the undesirability under any circumstances of keeping apart the health department and the education department.

This new Education (Administrative Provisions) Act of 1907 is unquestionably proving an invaluable means of improving the physical and moral condition of the children; and to whichever department its administration may be entrusted, its success will be in proportion to the closeness of the bond of union between the bodies concerned in carrying out its provisions.

REFERENCES.

The various regulations, circulars, reports, etc., issued by the Board of Education bearing on hygiene and education should be consulted, especially the following:—

Memorandum on Medical Inspection of Children in Public Elementary Schools. [Circular 576.] London: Wyman and Sons, Ltd., 1907. 2d.

Circular on Details of Medical Inspection with Specimen Schedule for Report on Child. [Circular 582.] London: Wyman and Sons Ltd., 1908. 1d.

Circular to Local Education Authorities under Part III. of the Education Act, 1902, on certain Questions arising under Section thirteen of the Education (Administrative Provisions) Act, 1907, and the Code of Regulations for Public Elementary Schools, 1908. [Circular 596.] London: Wyman and Sons, Ltd., 1908. 1d.

Circular to Local Education Authorities on Education (Provision of Meals) Act, 1906. Information and Statistics relating to the Feeding of School Children. [Circular 552.] London: Wyman and Sons, Ltd., 1907. 1d.

School doctors will also do well to make themselves acquainted with the provisions of such Acts as deal with children. The Children Act of 1908 has given rise to an extensive literature, mainly annotations of or works explaining the application of the Act. Among them the following may be recommended:—

Atherley-Jones, L. A., and Bellot, H. H. L.: "The Law of Children and Young Persons (in relation to penal offences) including the Children Act, 1908." London: Butterworth and Co., 1909. 10s. 6d. net.

Bonner, J.: "Protect the Children." London: United Kingdom Band of Hope Union, 1909. ½d.

Carter, H.: "The Children Act Explained." London: Robert Culley, 1909. 1d.

Dewar, D.: "The Children's Act, 1908, and other Acts affecting Children in the United Kingdom." Edinburgh and London: William Green and Sons, 1910. 7s. 6d.

Gentle, W. B., and Rawlings: "The Police Officer's Guide to the Children's Act, 1908." London: Effingham Wilson, 1909. 1s. 6d. net.

Gregory, A. E.: "The Children Act, 1908: Notes and Suggestions." London: National Children's Home and Orphanage, 1909. 1d.

Inglis, M. K.: "The Children's Charter." London: Nelson and Sons, 1909. 6d.

Newton, J.: "The Children's Charter: Some of the Provisions of the New Act." London: Children's Protection League, 1909.

REED, SIR A.: "The Children's Charter." Dublin: Church of Ireland Temperance Society, 1909. 1d.

WOOD, H. K.: "Provisions of the Children Act, 1908, Examined and Explained." London: W. V. Griffith and Sons, 1909.

The following may also be of service for reference:—

CHALMERS, A. K.: "Physical Inspection of School Children in Relation to Public Health Administration." *Journal of the Royal Sanitary Institute*, vol. xxvi.

CROWLEY, R. H.: "The Hygiene of School Life." London: Methuen and Co., 1910. 3s. 6d.

GULICK, L. H., AND AYRES, L. P.: "Medical Inspection of Schools." New York: Charities Publication Committee, 1908. $1. (Gives useful bibliography mainly to American literature.)

HOGARTH, A. H.: "Schools and the Public Health" in "Medical Inspection of Schools." London: Henry Frowde, and Hodder and Stoughton, 1909. 6s.

HOPE, E. W., AND BROWNE: "Manual of School Hygiene." Cambridge University Press, 1901. 3s. 6d.

MACKENZIE, W. L., AND MATTHEW, E.: "The Medical Inspection of School Children." Edinburgh and Glasgow: William Hodge and Co., 1904. 10s. 6d. net.

MACKENZIE, W. L.: "The Health of the School Child." London: Methuen and Co., 1906. 2s. 6d.

NEWMAN, G.: "The Health of the State." London: Headley Brothers, 1907. 1s. net.

The first "List of Official Publications" issued by the Board of Education will be of service to medical officers of health and schools. The recently issued "Public Health Service Directory and Year-book for 1910" (London: Hodgetts, Ltd.; 6s. net.), will also be of assistance for reference.

II

ORGANISATION AND ADMINISTRATION OF THE MEDICAL EXAMINATION OF SCHOOLS

BY

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AT the outset a practical difficulty confronts us. Medical inspection has been established with, on the whole, very little opposition. This may be taken to indicate that people generally have admitted its expediency. But the interest of organisers has been fixed on the novel element of the medical inspection of the children themselves; and it has not been vividly realised that medical inspection has also its application to school buildings and other arrangements. It cannot be said that this has touched the popular imagination as the medical examination of the children themselves has undoubtedly done; nevertheless the medical examination of the school environment is nearly as important as that of the physical state of the child.

The difficulty we anticipate is a certain lack of interest on the part of practical people in regard to what we

endeavour to present in this chapter. Many will be surprised and unprepared for what will seem a formidable extension of medical inspection. Let us attempt to deprecate this difficulty by frankly admitting that we conceive ourselves to be holding up the lamp of the ideal rather than propounding a scheme of action applicable in its every detail to all cases. On the other hand, our ideal scheme is perhaps not so formidable as it looks. Some of our English schools, especially the old country schools, are no doubt bad; but many of them are very passable without perhaps knowing it.

Nature of the Medical Examination of Schools.

By the Medical Examination of Schools is understood the examination of the school (apart from the children), together with all its educational methods and appliances, with a view to their hygienic fitness for their respective purposes. We use the term hygienic fitness in its broadest sense. It may be said, however, that the school doctor has nothing to do with the fitness of educational methods for their pedagogic purposes—that his duty is the simpler one of saying of a particular method that it is, or is not, injurious to health. But there is a health of mind as well as a health of body, and although a rough distinction is obvious enough, it seems beyond the wit of man to frame mutually exclusive definitions of the two. On the principle *nihil humani alienum puto*, it will be better to leave the term "fitness" unqualified, and at the risk of his being accused of grasping the whole range of pedagogy, to let the school doctor look at everything.

It may be said: What is this but handing over to the tyranny of doctors education which has barely escaped from the tyranny of priests? Though we are far from suggesting that this would be exchanging whips for scorpions, we desire no such thing. Doctors, like every other professional class, have their bias, their prejudices, and their limitations. As a profession their invaluable experience has been obtained in the close intimacy with disease, or perhaps one

should say with diseased people. Now school children in the mass are not sick people, nor is education exactly a disease. We want no domination of alien ideas; all that we are pleading for is the free play of physiological and hygienic notions at the very foundations of the educational system; and it may be freely and frankly admitted that the medical profession will have to readjust its standpoint somewhat before it can become the help to humanity in the matter of education which it is its pride to have become in other matters. But the medical profession clearly has the root of the matter in it, and no other body of men has or can have. The besetting sin of medical practice is faddism, and fads are the dry rot of education. What we want above all things is to develop a healthy medico-educational conscience with nothing neurotic about it.

Legal Authority for the Examination of Schools.

The enabling powers are contained in Section 13 of the Education (Administrative Provisions) Act, 1907, which recites that in respect of the Public Elementary Schools of the country the powers and duties of a local education authority shall include the *duty* to provide for the medical inspection of the children and the *power* to make such arrangements as may be sanctioned by the Board of Education for attending to their health and physical condition. Thus the Section confers no new duties or powers as to the examination of schools and appliances apart from scholars. The authority to inspect and report on these is derived from the Education Act, 1902, and more especially from Section 7 of the Act. This Act provides as follows: As to the "Council" or "provided" schools within its area, the local education authority must maintain and keep them efficient, a duty which would seem to include that of inspecting them. As to the "voluntary" or "non-provided" schools, so long as their managers desire them to be maintained and kept efficient and financed in certain particulars by the local education authority, the latter has power given it to inspect them; and the managers of a

school "shall, out of funds provided by them, keep the school house in good repair and make such alterations and improvements in the buildings as may be reasonably required by the local education authority; provided that such damage as the local authority consider to be due to fair wear and tear in the use of any room in the school house for the purpose of a public elementary school shall be made good by the local education authority."

Although the Education (Administrative Provisions) Act, 1907, does not mention school buildings, the various memoranda of the Board of Education issued in pursuance of the purposes of the Act leave no doubt that the "environment" of the child is no less an objective than the child itself. Especially is the matter put out of all question in Circular 596, Section 6 (*a*), where the school medical officer is directed to give in his report a general review of the hygienic conditions prevalent in the schools in the area of the local education authority in respect of such matters as surroundings, ventilation, lighting, warming, equipment, and sanitation, including observations of the type and condition of sanitary conveniences and lavatories, water supply, cleanliness of school-rooms and cloak-rooms, and the relation of the general arrangements of the school to the health of the children.

Inspection and Amelioration of School Conditions.

The medical examination of schools, methods, and appliances, like the medical inspection of the scholars themselves, was intended to lead directly to efforts to ameliorate the evils disclosed. The Circulars of the Board of Education are literally full of this practical purpose. Hence the organisation and administration of medical inspection of schools falls to be considered under two heads: (*a*) the detection of faults, and (*b*) the application of remedies. We must, therefore, devote attention in the first place to a consideration of school buildings, methods, and appliances, with a view to the best way of reporting on them as means of education; in other words, an "Intelli-

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gence Department" must be organised. In the second place we must consider the best methods of co-ordinating the information thus collected and of bringing it to bear on the improvement of the schools as means of education.

The Intelligence Department of the School Medical Service.

What we have called the intelligence department will have to take cognisance of two groups or orders of facts. There must, first, be a sort of *hygienic census of schools*—or rather of individual school-rooms. Such a census, if ideally perfect, would comprise plans and sections of the various rooms, together with an inventory of all points of interest to a school medical officer. In regard to each school-room he would want to know the cubic capacity; height and width of doors; position and size of windows; the methods of heating and ventilating; etc. There must be a similar inventory of school furniture considered from the hygienic point of view. And there are many other matters. A complete enumeration of hygienic points of interest is attempted in a suggested model schedule given below.

Many of the data for such a census will be found already in the possession of the Surveyors' Departments of the various local education authorities; but in all probability they will have to be thoroughly revised from a school doctor's point of view, and supplemented at a score of points by special reports from the assistant school medical inspectors.

The second group or series of facts of which the intelligence department would have to take cognisance would consist of the observations of the various inspectors on current conditions of the school. These might be called *current reports*. The facts would comprise in regard to particular school-rooms observations at a given time in particular circumstances of wind and weather, on the state of the ventilation and the heating, etc. Was the room "stuffy" or fresh? Uncomfortably hot or unpleasantly

cold? Was it well lighted? Was it draughty? Similar reports would be gathered in respect of school sanitary offices as to their cleanliness and efficiency. Every effort should be made if possible to ascertain these facts by means of standard instruments and independently of mere personal impressions.

The hygienic census of schools would start with the existing particulars of school buildings in the archives of the surveyor's office as a nucleus, and about this nucleus would be grouped the various items of information mentioned below in the model schedule. These items would be collected by the assistant school medical officers or other inspectors with suitable sanitary or surveying qualifications, acting under the direction of the school medical officer. The taking of this inventory or census need not be completed at one operation; it might extend over a year or two, dealing with points of greatest urgency first.

The collection of the facts to be embodied in the current reports would, according to circumstances, be partly in the hands of the school medical officer and the assistant school medical inspectors, who visit the schools at stated times, and partly in the hands of inspectors who would pay surprise visits. These latter officers may be either the usual inspectors of the local sanitary authority acting under the guidance of the school medical officer where he is also the medical officer of health; or they may be the school attendance officers under the same guidance; or *ad hoc* inspectors, according to the requirements of the case. They would be instructed to report on particular points bearing on one or other of the headings enumerated in the model schedule. The reporting would be simplified by having report sheets containing printed stereotyped questions admitting of laconic answers. The reports and the chemical or other analyses to which they may give rise might finally be still further condensed on the cards of a card index under the heading of the proper school, and the reports themselves filed for easy reference. In this manner data of high value would ultimately be acquired for each school, by means of which on the one hand the efficiency

of the buildings and educational appliances could be tested, and on the other the prevalence of particular ailments or defects could be in certain cases explained.

Suggested Model Schedule for the Medical Examination of Schools.

The scheme of this chapter does not admit of a discussion of the general principles of sanitation as applicable to the particular purpose of the education of children; but it must not be forgotten that only by a firm grasp of essential principles can pedantry and faddism be avoided. When scientific discoveries come to be applied to practical life the tendency is at first to great complexity; simplicity comes later. Complexity surely reaches its extreme when it is suggested by some authorities that each individual child should be measured and fitted with its special school chair, and again by others that no child should sit always in the same place but should hour by hour be moved from one position to another in order that monotony may be prevented and opportunities equalised; and yet there is a measure of truth in both suggestions. Such counsels belong to the early enthusiastic stages of applied science, and a discussion of fundamental principles might have advantageously preceded the Schedule of points of interest for the school hygienist which we are about to submit. As it is we must be content with a mere list of headings.

SUGGESTED SCHEDULE
REGARDING THE MEDICAL INSPECTION OF SCHOOLS AND SCHOOL BUILDINGS, ETC.

Containing
Hygienic Points of Practical Interest
to School Medical Officers.

This suggested schedule is intended as a guide in the making of a Hygienic Census of Schools, and also as an indication of the points to be reported upon in the Current Reports.

A.—THE SCHOOL.

General Considerations.

I. *Site and Surroundings.*—

General configuration of site; altitude; exposure; type of climate; geological formation.

Soil; subsoil; ground-water and ground-air, and the measures which have been adopted to cope with them, *e.g.*, subsoil drainage, raised buildings, damp-proof courses, under ventilation, concreted building area, etc.

Neighbourhood of school buildings; distance from trees, other buildings, busy thoroughfares, railways, and factories or work-places emitting noxious fumes, dust, smoke, etc.

II. *Buildings.*—

Orientation; general plan of school; corridors; passages; stairs; ceilings; floors; roof.

Cloakrooms; lavatories and baths; playgrounds; dwelling-houses of teachers or school servants if existing.

III. *Water Supply.*—

Drinking water, public or private supply, storage on premises or direct from mains; if from wells, their depth, construction and surroundings.

IV. *Drainage.*—

Drains; school offices; sanitary fittings; eaves spouting; all of which should comply with requirements reasonable for a properly equipped house.

Special Considerations.

In respect of each classroom :—

I. *Orientation.*—

Exposure; proximity to trees, other buildings, thoroughfares, etc.

II. *Structure.*—

Dimensions : length, breadth, height, area of floor space and cubic capacity.

Floor : level or stepped; material; covering or nature of surface; cellared or not; under ventilation; means of preventing accumulations of dust.

Walls : material; nature of surface; colour; reflections; panelled or not (*e.g.*, for warmth); angles rounded off or not; etc.

Ceiling or roof : formation; material; colour; is there a room or only unoccupied space above.

Windows : wall windows, skylights or dormers; are they casement or sash; aspect of each group of windows; size; formation (large or small paned, bevelled sides, etc.); height of sill from floor; depth of top from ceiling or roof; nature of glazing. Also in regard to the best and the worst placed desks the three following data :—

Angle of aperture.

Angle of incidence.

Angle to the horizontal at which a beam enters over the sill.

Doors : width; formation (single or leaved); direction of opening (inwards or outwards).

Æsthetics : colour and decorative treatment generally.

III. *Lighting.*—

Describe clearly the relative positions of the school desks or seats in the room, together with that of the teacher's desk, the blackboard, etc., and then describe in general terms (not repeating the dimensions of windows, which are given above) the lighting of the class-room under the following headings :—

(*a*) *Natural Lighting.*—

(1) Main light; aspect (north, south, east or west); direction in relation to scholars seated at the desks.

(2) Supplementary lights: aspect; direction. Means of screening off light: blinds, curtains, etc.

(3) An actual observation of the illumination at the worst-lighted desk in the room by means of some standard measure of illumination (noting the nature of the sky illumination, sunny, cloudy, etc.); or less accurately by testing the reading power of a normal sighted person.

(4) Summary description of the illumination, emphasising the various factors enumerated above according as they contribute to the result.

(*b*) *Artificial Lighting.*—

(1) Nature of illuminant.

(2) Number, intensity and position in relation to the desks.

(3) Actual observation of the illumination at the worst-lighted desk or desks in the room, tested by a standard measure, or by trial of a normal person.

(4) Summary description of general illumination.

IV. *Heating.*—

Describe the contrivances for heating the class-room, such as fire-grate, or stove, stating the types respectively and, if a stove, the length and dimensions of any pipe within the room acting as a chimney; radiators, steam or water circuits, giving area of radiating surface.

Also contrivances, if any, for maintaining moisture of air.

Readings of thermometers placed (1) on or close to floor, (2) about five feet above floor, (3) wet-bulb reading after three minutes' pendulum motion.

Impressions of Inspectors.

All such readings and impressions should be accompanied by notes of the temperature, wind, and weather outside.

V. *Ventilation.*—

Describe the specific contrivances relied on to secure ventilation, natural, mechanical or other, and give the area and positions of openings.

The draughts of the room, based on impressions or statements of teachers and on anemometer readings at various openings.

B.—THE SCHOOL FURNITURE.

School Desks.—

Describe the kind of desks in use, single, dual, or multiple, whether individually adjustable or group desks suited to a certain average of size.

Give particulars of (1) the desk proper, size and angle of slope; (2) seat, width and height above floor; (3) back, shape and slope.

Give the measurements known as "height of space for sitting" (viz., vertical measure from front edge of desk to seat) and "depth of space for sitting" (viz., horizontal measure from front edge of desk to back of seat); state whether front edge of desk overhangs or falls short of front edge of seat.

Give the space allowed between the desks.

Foot stools.

Teacher's Desk and Platform.

School Cupboards.—

Whether adequate; likely to accumulate dust; etc.

Blackboards or Wall Slates.

Maps, Diagrams, Pictures; chiefly as regards visual clearness.

In addition to these larger articles there is not one of the minor implements of education but may occur in a hygienically good or bad form—pens and penholders, slates and pencils, books (tone of paper and type of printing), satchels, etc.

C.—THE SCHOOL CLEANING.

A much higher standard as regards cleanliness is wanted in our public elementary schools.

Dust swept in by the wind or carried in by children's boots and clothes is the chief cause of uncleanliness. A report on cleanliness, therefore, should refer to—

1. Means of preventing the access of dust, including an adequate surrounding space of dustless paving, boot scrapers and mats, school shoes or slippers, regulations for securing that children come in clean clothes, arrangements for storing outer garments in special cloakrooms, arrangements for making walls and floors impermeable to dust, and incapable of lodging dust in corners or on ledges, etc. With these means must be mentioned the school waste-paper basket.

Under this heading also should be mentioned the heating and ventilating arrangements as possible importers or distributors of dust.

2. Means of Removing Dust.—Manual labour is still the chief means. The following is suggested as a fair standard of attainment.

(*a*) A daily dusting and sweeping with damp cloths and damp sawdust, not forgetting the tops of doors, picture frames, etc. School offices should be inspected daily and cleansed whenever needed.

(*b*) A fortnightly scrub-washing of floors, and of walls for four or five feet above the floor. When floors are permeable to wet and not under-ventilated this may be a counsel of perfection, for wet is very harmful to wood; but this harm can be lessened in many ways. Windows should be cleaned once a week, inside and out, in towns. A monthly cleaning might suffice in the country.

(*c*) A thorough "spring cleaning" two or three times a year, according to neighbourhood.

Action Based on the Reports.

Having described an organisation for the examination of schools, we must now state how the information collected can be utilised for their improvement. This is a task both difficult and academic. It is difficult because there are already existing arrangements for amending defects of schools which partially occupy the field. It is academic because there is as yet no accomplished fact to describe—hardly even any promising experiment. We must be content to survey the field and to adumbrate a scheme which will doubtless lay us open to that most damaging of criticisms, the charge of being "theoretical."

Survey of Existing Organisations.

Sanitary Authorities.—England and Wales are broadly divided for local government purposes into (1) Administrative Counties, (2) County Boroughs, the latter, of course, being urban areas. Administrative Counties apart from London are further sub-divided into Urban and Rural Districts. We thus have the whole country plotted out into a mosaic of local sanitary areas, which constitute the units of sanitary administration. The councils which are the local sanitary authorities of these areas are required to appoint properly qualified medical officers of health, who report to their authorities and also direct to the Local

Government Board. The county councils of administrative counties have also certain powers and receive from the medical officers of health of the constituent districts the reports, periodic and otherwise, which are sent to the Local Government Board. County councils have also the right of complaint under Section 299 of the Public Health Act, 1875, in case local sanitary authorities make default of their duty, and they may appoint a county medical officer of health who, however, has no authority over district medical officers of health.

In the case of London the Administrative County (which does not include the City of London), is divided into twenty-eight Metropolitan Boroughs, the council of each of which is the local sanitary authority, appointing a medical officer of health. But the London County Council have certain powers even within the City, for example, the control of main sewers; in fact, with the exception of the Port of London, which is under the City Corporation, there is no part but has more than one public body exercising the functions of an administrative authority in some matter of public health.

The medical officers of the sanitary authorities have definite powers in regard to schools and scholars. It is their duty to investigate epidemics and to take steps to avert or check them. For these purposes they are entitled to enter schools on reasonable suspicion, since a school is a "house" within the meaning of the Acts and may therefore be entered and inspected for such purposes and when nuisances and overcrowding or insanitary conditions are alleged or on reasonable grounds suspected. But there must be suspicion. Medical officers of health have no roving commission to hunt for nuisances or search for possible cases of illness in schools.

One specific power of the sanitary authority must be mentioned. A sanitary authority, or any two members thereof, acting on the advice of the medical officer of health, may close a school in their area, or exclude certain children for a specified time, with a view to preventing the spread of infectious disease or any danger to health likely

to arise from the insanitary condition of the school. Against this there is now no appeal.[1]

Education Authorities.—The unit area for education is not always the same as that for sanitation. The council of every administrative county and of every county borough is the local education authority for its own area: except that boroughs and urban districts within an administrative county, if possessed of more than 10,000 or 20,000 of population respectively, constitute independent local education areas in respect of elementary education.[2]

Each of these local education authorities is directed by the Board of Education to appoint a school medical officer who must be approved by the Board and whose duty it is to report to his local authority, and the local authority must send a copy of the report to the Board of Education. The school medical officer may or may not be the medical officer of health of the same area. Thus it will be seen that the organisation of school medical inspection under the local education authorities is far from uniform. We may have cases—(1) Where the school medical officer is the same person as the medical officer of health supervising a single sanitary area; (2) where the school medical officer is a different person from the medical officer of health, but supervises the same area as the latter; (3) where the school medical officer supervises for the education authority an area consisting of several independent sanitary areas of which each has its medical officer of health.

To the school medical officer as representing the local education authority are given very wide powers of examination of schools and scholars. Within the precincts of the school he may inspect at any time and for almost any purpose. He may ferret out nuisances which are comfortably hidden away, and he is by no means limited to statutory nuisances. In addition to these general powers are the specific functions assigned to him: (1) Of advising or approving the closure of schools—"advising" where the

[1] See L. G. B. "Memorandum on Closure of and Exclusion from School." Section 3 (*a*). London: Wyman and Sons Ltd., 1909. 2d.

[2] See Education Act, 1902, Part I.

facts can be put to him beforehand, and "approving," *ex post facto*, when the closure has been done in an emergency[1]; (2) of authorising the exclusion of children from a school on certain specific grounds which grounds will be regarded as "reasonable" when so authorised.

Procedure in the Medical Examination of Schools.

This brief survey of the powers of the education and sanitary authorities will have shown that they overlap not only in regard to the closing of schools and the exclusion of children as means of coping with epidemic ailments, but also in regard to matters of drainage, water supply, cleansing and disinfecting of premises, as well as in regard to nuisances and overcrowding affecting schools. As touching any one of these matters it is conceivable that the two authorities might be taking action at the same moment, each in ignorance of the action of the other, in cases where the school medical officer and the medical officer of health are not the same person. It is clear that the first step in the organisation of medical inspection, where the two officers are not identical, should be the establishment of a *modus vivendi* calculated to avoid the evil results of such overlapping.

The brief survey of their respective powers will also have shown that of the two authorities, education and sanitary, it is to the education authority that the wider scope and larger powers have been assigned. Even the point of view is somewhat different. Instead of defects being removed only where they have proved themselves to be nuisances, defects are to be sought out and reported upon. As we have seen, the Board of Education direct that the school medical officer shall report to his authority on all arrangements of the schools, both general and particular,

[1] One instance of the exercise of this power which will facilitate the rapid working of educational and sanitary procedure deserves special mention; it is that recommended by the Board of Education and the Local Government Board in their conjoint Memorandum already referred to. Schools may now be closed or scholars excluded on the joint certificate of the medical officer of health and the school medical officer, without an appeal to the local sanitary authority of two members thereof (Memorandum, p. 5, Section 3 (*c*)).

as they bear on the health of the children, with a view to making the school environment more wholesome.[1] It will, therefore, naturally fall to the education authority to take the initiative in the majority of such cases where conjoined action with the sanitary authority is called for or desirable.[2]

It is no part of our duty in this chapter to suggest any working arrangement between the education and the sanitary authorities in respect of their powers of excluding children from school. That matter concerns scholars rather than schools, and must be sought for in another chapter. We will, however, assume it as agreed upon that when one authority exercises its powers to close a school, or exclude certain children, it shall notify the other of what it has done.

Consultation with Teachers.

Our present business is with school buildings, appliances and methods. In regard to such things we may suppose the school medical officer to have in his hands reports of defects, and to have formed the opinion that certain things should be amended. The function of the school medical officer in this respect is of course advisory and not executive, and it is of the first importance that his advice should go to the proper authorities with all the prestige of a well-thought-out and unobjectionable scheme. For this purpose it would be of value if at this stage of the proceedings some recognised means were available, such as a

[1] See Circular 596, Section 6 (*a*).

[2] As illustrating the wider scope and somewhat different point of view assigned to the school medical officer we may quote the following from the "Memorandum on Closure of and Exclusion from School, 1909," p. 15, Sect. 36: "But while the Medical Officer of Health in deciding whether to advise the Sanitary Authority to require the closure of a public elementary school will be guided mainly by the consideration how best to check the spread of disease, other considerations may require also to be taken into account by the School Medical Officer in deciding whether to advise or to approve action taken voluntarily under Art. 45 (*b*) of the Code. . . . The question of closure, when that step is not clearly necessary to prevent the spread of disease, should therefore be left to the voluntary action of the Local Education Authority, advised by the School Medical Officer, if he is not himself Medical Officer of Health. That officer, however, before advising or approving closure, should confer with the Medical Officer of Health on the public health aspects of the proposed closure." The whole section should, however, be studied.

consultative committee of teachers, by which the views of teachers on the alterations contemplated could be stated with authority and have their due weight.

An Ideal Administrative Scheme.

In what follows we do not presume to suppose that we are suggesting the best—and still less the only—form of a convention between the parallel and independent education and sanitary authorities. Doubtless many forms of working arrangement could be devised. We merely suggest one as a type of arrangement conforming to what we conceive to be the ideal plan, in which the education authority takes the initiative in any amendment of the sanitary conditions of schools which is suggested in the interests of healthy education.

One point of merely academic interest may be first cleared out of the way. In the event of a school becoming a nuisance to surrounding neighbours the sanitary authority would act precisely as it does now, with full responsibility, calling upon the education authority, or the managers, as the case may be, to perform their statutory duty.

The remaining matters as to which the school medical officer was of opinion that alterations or amendments should be made would seem to fall into three groups:—

(1) In the first group would come all those matters within the competence of routine administration. Such are minor defects of drainage and water supply, cleansing, disinfection, and the abatement of easily rectified nuisances, such things as trivial defects in the working of apparatus, inadequate cleansing of premises, and the like. Here the school medical officer, if he were a different person from the medical officer of health, would act independently of the latter, as the officer of the authority who is responsible for remedying the defects or for seeing that they are remedied, should the responsibility rest with local managers, as in certain cases it would do. All these matters would be brought by the school medical officer to the notice of the director of education, or the clerk or other person

authorised by the education committee to act in minor matters, or in emergencies.

(2) In the second group would come the more serious matters involving structural alterations, the introduction of new principles of action, or suggested radical changes in procedure, and would form the subjects of special reports by the school medical officer to the education committee.

(3) In the third group would come those matters which might call for action on the part of the local sanitary authority as the executive health authority for the district, such as the absence of proper facilities for drainage, nuisances in adjoining premises, irregularities in the main water supply should it be in the hands of that authority. In the case of this group the convenient and courteous procedure would be for the school medical officer, if he were not also the medical officer of health, to call the attention of the latter to the defects, reporting to the education authority in the ordinary course that he had done so; and it would only be in the event of the matter not receiving due attention that any formal communication regarding it need go from the education authority to the sanitary authority.

REFERENCES.

Apart from legal publications no works on Medical Inspection of School Children are included in the following list, unless they treat wholly or in part of school buildings, educational methods, or hygienic appliances. The dates given are, so far as can be ascertained, those of the latest editions. The list is a select one and we have endeavoured to increase its usefulness for reference by a convenient classification.

Legislative.

Elementary Education Acts, 1870, 1873, 1876, 1880.
Voluntary Schools Act, 1897.
Board of Education Act, 1899.
Elementary Education Act, 1900.

Education Act, 1902.
Education (Administrative Provisions) Act, 1907.
Local Education Authorities (Medical Treatment) Act, 1909.

Copies of all the above Acts of Parliament dealing with educational affairs may be obtained from the official publishers, Messrs. Wyman and Sons, Ltd., Fetter Lane, London, E.C., and 32, Abingdon Street, Westminster, London, S.W.; and Messrs. Oliver and Boyd, Tweedale Court, Edinburgh; and E. Ponsonby, 116, Grafton Street, Dublin.

GULICK, L. H., AND AYRES, L. P.: "Medical Inspection of Schools." New York: Charities Publication Committee, 1908. $1. (This book contains a chapter on the legal aspects of medical inspection, chiefly in the United States, and also an historical chapter.)

HIME, T. W.: "Practical Guide to the Public Health Acts." London: Baillière, Tindal and Cox, 1901. 15s. net.

LUMLEY: "Public Health." London: Shaw and Son, 1908. £3 17s. 6d. net.

"Public Health Acts." London: Knight and Co., 1908. 8s. 6d. net.

HYGIENIC.

VON ESMARCH, E.: "Hygienisches Taschenbuch." Berlin: Julius Springer, 1908. 4s., bound.

NOTTER AND FIRTH: "Theory and Practice of Hygiene." Ed. by R. H. Firth. London: J. and A. Churchill, 1908. 21s. net.

PARKES, L. C., AND KENWOOD, H. R.: "Hygiene and Public Health." London: H. K. Lewis, 1907. 10s. 6d. net.

REID, G.: "Practical Sanitation." London: C. Griffin and Co., 1910. 6s. net.

STEVENSON AND MURPHY: "Hygiene and Public Health." London: J. and A. Churchill. Vol. i., 1896, 28s. net; vol. ii., 1893, 32s. net; vol. iii., 1894, 20s. net.

WHITELEGGE AND NEWMAN, G.: "Hygiene and Public Health." London: Cassell and Co., 1908. 7s. 6d.

WILLOUGHBY: "Health Officer's Pocket Book." London: Crosby, Lockwood and Son. 10s. 6d. net.

The above treatises deal with the hygiene of buildings in general. The list is not exhaustive, but it covers the ground. Turning now to the specific subject of school buildings, many articles on the hygiene of schools are scattered in numerous reports, transactions, and journals. The following will be of service:—

Transactions of the International Congresses on School Hygiene:—

I. "Bericht über d. I. international. Kongress f. Schulhygiene in Nürnberg." Ed. by P. Schubert, Bauer, Eiselein, Frankenburger, and others. 4 vols. Nuremburg: Schrag, 1904. 30s., paper.

II. "Transactions of the Second International Congress on School Hygiene, London." Ed. by James Kerr and E. Wallis White. 3 vols. London: Royal Sanitary Institute, 1908. 12s. 6d., paper; 15s., bound.

Zeitschrift für Schulgesundheitspflege. With a supplement: *Der Schularzt.* Edited by Stephani (Mannheim). Founded by Kotelmann in 1887. Hamburg: Leopold Voss. M.12 per year.

Internationales Archiv für Schulhygiene. Edited by Mathieu, Sir Lauder Brunton, A. Johannessen, and Griesbach. Founded 1905. Leipzig: Wilhelm Engelmann. 20s. per vol. yearly.

School Hygiene: a Monthly Review for Educationists and Doctors. London: School Hygiene Publication Co. Ltd. 6s. per year.

The following periodicals now include school medical inspection matter in their scope:—

Public Health: the Official Organ of the Society of Medical Officers of Health. London: Published by the Society. 21s. per year.

Journal of the Royal Sanitary Institute. London: Ed., Stanford. 12s. per year.

The Medical Officer: a Journal for Medical Men in the Government and Municipal Services. London: Published weekly. 12s. 6d. a year.

Many papers are to be looked for in the general medical journals, *The Lancet*, *The British Medical Journal*, etc.; some also in *Child Study*, the Journal of the Child Study Society. London: Edward Arnold. 6d. quarterly.

The following treatises will be of service to the school doctor for reference:—

BAGINSKY, A.: "Handbuch der Schulhygiene." Stuttgart: F. Enke, 2 vols., 1898 and 1900. 30s., bound.

BURGERSTEIN, L., AND NETOLITZKY, A.: "Handbuch der Schulhygiene." 2nd edition. Jena: Gustav Fischer, 1902. 22s., bound. (This work affords a complete exposition of the subject in all its departments to the date of its publication.)

CLAY, FELIX: "Modern School Buildings." London: B. T. Batsford, 1902. 25s. net.

COLLINS, H. BEALE: "The Hygiene of Schools and Scholars." London: Ralph Holland and Co., 1902. 2s.

COWHAM, J. H.: "School Organisation, Hygiene, Discipline, and Ethics." London: Westminster School Book Depôt, 1901. 3s. 6d.

CROWLEY, RALPH H.: "The Hygiene of School Life." London: Methuen, 1910. 3s. 6d. net.

DAVIES, A. M.: "Handbook of School Hygiene for Teachers in Army Schools." London: Wyman and Sons, 1907. 6d.

DOUGLAS, C. C.: "Laws of Health." London: Blackie and Son, 1907. 3s. net.

DUKES, CLEMENT: "Health at Schools." London: Rivington, 1905. 10s. 6d.

ELKINGTON, J. S. C.: "Health in the School, or Hygiene for Teachers." London: Blackie and Son, 1907. 2s. net.

FORSYTH, D.: "Children in Health and Disease." London: John Murray, 1909. 10s. 6d. net.

FÜRST, M., AND PFEIFFER, E.: "Schulhygienisches Taschenbuch." Hamburg: Leopold Voss, 1907. M.4.

HOGARTH, A. H.: "Medical Inspection of School Children." London: H. Frowde; Oxford University Press, 1909. 6s.

HOPE AND BROWNE: "A Manual of School Hygiene." London: Clay and Sons; Cambridge University Press, 1901. 3s. 6d.

JANKE, O.: "Grundriss der Schulhygiene." Hamburg: Leopold Voss, 1901. 5s., bound.

JONES, H.: "School Hygiene." London: J. M. Dent and Co., 1907. 2s.

KOTELMANN, BERGSTROM AND CONRADI: "School Hygiene." Syracuse, New York: C. W. Bardeen, 1899. (This is a translation of Dr. Kotelmann's German book on the subject revised especially for the purpose of the American publication. It contains 30 pages of bibliography of American and English books and papers on school hygiene.)

LYSTER, R. A.: "School Hygiene." London: University Tutorial Press, 1908. 3s. 6d.

MACKENZIE, LESLIE, AND MATTHEW, E.: "The Medical Inspection of School Children." Glasgow and Edinburgh: Wm. Hodge and Co. 1904. 10s. 6d. net.

MACKENZIE, LESLIE: "The Health of the School Child." London: Methuen, 1906. 2s. 6d.

NEWSHOLME, A., AND PAKES, W. C. C.: "School Hygiene." London: Swan Sonnenschein and Co., 1905. 3s.

POELCHAU: "Anleitung für die schulärztliche Tätigkeit." Hamburg: Leopold Voss, 1908. 2s. 6d. paper.

PORTER, C.: "School Hygiene and the Laws of Health." London: Longmans, Green and Co., 1908. 3s. 6d.

RAVENHILL, ALICE: "Lessons in Practical Hygiene for use in Schools." Leeds: E. J. Arnold and Son, 1907. 5s. net.

ROWE, S. H.: "The Lighting of School Rooms." London: Longmans, Green and Co., 1904. 3s. 6d. net. (This book contains 3 pages of bibliography, mainly American and German works.)

SHAW, E. R.: "School Hygiene." London: Macmillan and Co., 1901. 4s. 6d. net.

SMYTH, A. WATT: "The Principles of Hygiene based on Physiology." London: Simpkin, Marshall, Hamilton, Kent and Co., 1905. 6s.

WELPTON: "Principles and Methods of Physical Education and Hygiene." London: University Tutorial Press, 1908. 4s. 6d. net.

III

ORGANISATION AND ADMINISTRATION OF THE MEDICAL EXAMINATION OF SCHOLARS

BY

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WHERE a system of medical inspection was in vogue prior to the passing of the Education (Administrative Provisions) Act, 1907, the practice most frequently followed was to inspect only those children who were selected either by the teacher or by the medical inspector as requiring detailed examination. This selective basis of voluntary schemes is now superseded by the compulsory requirement that provision shall be made for the routine medical examination of all children attending public elementary schools. In the terms of the Act each child must be inspected either "immediately before, or at the time of, or as soon as possible after admission to a public elementary school, and on such other occasions as the Board of Education direct."

The Board of Education has decided[1] that additional inspections should take place "the second at or about the third year (say, the seventh year of age); and the third at or about the sixth year of school life (say, the tenth year of age)." It is, moreover, suggested that "a further inspection

[1] Memorandum on Medical Inspection of Children in Public Elementary Schools, under Section 13 of the Education (Administrative Provisions) Act, 1907 [Circular 576], paragraph 12. London: Wyman and Sons Ltd. 2d.

immediately before the departure of the child into working life would be desirable where practicable, and in some areas it may be best for this to take the place of the third inspection."

Probably in order to facilitate the successful inauguration of medical examinations, the three (or four) inspections are not at present necessary, the Code requirements[1] being that "the Board must be satisfied that provision has been made for the medical inspection of all children admitted to the school since August 1st, 1909, and of all children who are expected to leave school before July 31st, 1910." In the prefatory note is a further statement that school authorities are expected "to make preparation for examining an intermediate group of children in the year commencing August 1st, 1910."

The Classification of School Children for the Purpose of Medical Examination.

The grouping of children as those entering school and those expected to leave before a certain date does not tend to facilitate either clerical work or organisation, as there is considerable variation in the ages of such children. The compulsory age for school attendance is five, but in many schools children will be found in attendance at the age of four, and even three. A complete inspection of such children is not of much value, and though it is a statutory obligation that they should be inspected, perhaps a more superficial examination would meet the requirements provided they are submitted to a complete schedule inspection at age five. There are also children who have been admitted at later ages, most of whom have been transferred from other schools and so should not be regarded as "entrants." In the case of children whose admission has been deferred for a year or two it will be found that many present some physical weakness. It is my practice to group these latter among "exceptional cases," and in this way neither younger nor older "entrants" escape early inspection, but the word

[1] 1909-10, Article 58 (*b*).

"entrants" obtains a definite significance for purposes of classification, as it indicates children of five years of age in the year of inspection. By arranging for two inspections a year, practically every child comes under notice in the year in which it attains that age.

Children leaving school likewise vary in age, the usual being fourteen, but by passing certain examinations it is possible for a child to leave at the age of twelve or thirteen; it is also not uncommon in some districts to find children in attendance aged fifteen. It would, therefore, be an advantage if the final inspection had reference specifically to children who would be thirteen years of age in the year of inspection. This is the basis of inspection in the county of Kent, where a special effort was made in 1909 to examine as "leavers" all children of that age as well as those of higher age. In fixing this age standard, it was necessary to arrange for an examination of these older children in order to avoid any leaving school without having been first inspected. I believe that future work will be so simplified that the extra effort will prove to have been worth while. Similar objections may be advanced against the grouping of children according to the years of school life.

In defining the age of a child for classification purposes it is desirable to have a fixed rule, and perhaps the best is to regard a child as being of the age to which it will attain in the year of inspection. Such a rule has two advantages, the first being that it would appear to give greater accuracy when results are to be used for comparative purposes, and secondly it materially assists in clearness of instructions to teachers and medical inspectors respecting the work which is to be undertaken in any given period. Although some children will not attain the age decided upon until December 31st in any given year, others will have done so on January 1st, so that where large numbers are concerned the average will represent a fairly accurate figure. As regards instructions, the rule enables the definite statement to be made that children born in a certain year should be prepared for inspection; thus in 1910, if thirteen-year-old children are to be inspected, the instructions would read

"all children born in 1897 should be submitted for inspection," and similarly if it is the ten-year-old group the instruction would read "all children born in 1900," and so on.

Frequency of Inspections.

The fact that the Act requires children to be examined either before, at the time of, or as soon as possible after admission, seems to indicate that some definite standard should be laid down as regards the minimum frequency of inspections. One visit a year for this specific purpose would hardly suffice except in the very small schools with a roll of 100 or less. In the case of the larger country schools two visits may be necessary, and in the largest town schools three, or even four. The inspection of "entrants" can be best arranged for by dividing the school year into two or more periods in which to conduct different series of inspections, at each of which the whole of the inspections of one of the higher age groups might be carried out, together with the inspection of children who have been entered on the roll of the infants' department since the last visit. In large towns where work is going on continuously and each school receives numerous visits from an inspector, the routine work is easily arranged, but in the country schools some well-defined system is necessary.

Objects of Medical Inspection.

For the purpose of the present chapter, the objects of medical inspection may be regarded as the discovery of children presenting some deviation from the normal. These may either be (*a*) physical or mental defects which will prejudicially affect the future physical development or intellectual progress of a child, or (*b*) ailments of an infectious or contagious nature which render it inadvisable that children so suffering should associate with their fellows. These defects may or may not have been previously within the knowledge of the parents. This limitation, however, is not applicable to the work generally,

for even as regards the actual inspections it is as important that classes and schools as a whole should come under experienced survey as it is for the individual members to be submitted to a detailed examination. Special investigation work in various directions will also be found desirable, and consideration will require to be given to such matters as the relationship between defects discovered and school or home conditions, and to the ameliorative measures which local conditions and circumstances would seem to indicate should be adopted.

Character of Medical Inspection.

A schedule has been issued by the Board of Education indicating the particulars which are to be regarded as constituting the *minimum* of efficient medical inspection.[1] The use of this form is not compulsory, but any substituted schedule must include all the official details, and a statement regarding the extent of the variation and the reasons for such must be made in the annual report.[2]

The schedule will provide particulars relating to the following:—

Personal Details.—These include name, address, and date of birth of the child, and the official designation of the school.

Personal and Family History.—Under this heading is included a record of previous attacks of the commoner zymotics. Information respecting these diseases is most frequently obtained by formal inquiry of the parents previous to the date of inspection. It is the practice in some districts similarly to seek information respecting a large number of diseases from which the child may previously have suffered, and also to inquire into the previous health history of the parents. The knowledge thus gained

[1] Circular on Details of Medical Inspection with Specimen Schedule for Report on Child [Circular 582]. London: Wyman and Sons Ltd., 1908. 1d.

[2] Circular on Medical Inspection including functions of School Medical Officer, Local Education Authority's Report, etc. [Circular 596], paragraph 6 (*b*) (*i*). London: Wyman and Sons Ltd., 1908. 1d.

is of importance as it cannot be otherwise obtained unless the parents attend the inspection, which is far from being an invariable rule. Full particulars of previous illnesses not only shorten the duration of inspections by limiting inquiries to be made at the time, but also give a clue to the possible presence of certain defects. This complicates the statistical summary if it is proposed to note these circumstances, since the children in respect of whom information has been received must be differentiated from the others.

Matters of Administrative Concern.—Date of inspection, standard, and regularity of attendance. The two latter points require to be particularly noted in inspecting cases of supposed mental deficiency, or even in forming an opinion as to the child's intellectual standard.

General Conditions include sufficiency and cleanliness of clothing and footgear, and cleanliness and condition of the skin and head. Extreme cases of neglect, particularly as regards cleanliness or verminous conditions, should be noted for reference to the sanitary department with the idea of subsequent inspection of the home, and in cases in which the conditions remain unimproved the provisions of the Children Act should be borne in mind. The effect on the child as regards insufficiency of clothing or footgear should likewise be noted.

Entries on the schedule must necessarily be of the briefest character, and it is officially suggested that the gradation should be good, average, and bad. The personal element plays such an important part in recording observations that a complicated system is undesirable. Too great a subdivision is not necessary in routine inspections, though in special inquiry work further subdivision than the one suggested might be an advantage. The figures 1, 2, and 3 may be used instead of words by giving them a similar significance, and in the case of verminous conditions it is my practice to regard " 1 " as indicating a perfectly healthy state, " 3 " as referring to a condition which is sufficiently serious to justify exclusion, and " 2 " as a designation for all intermediate states.

Physical State, as evidenced by height, weight, and nutrition. Weight is ascertained in ordinary indoor attire without boots, and the height is likewise ascertained without boots, the child standing erect with the weight thrown on the heels. The recording of nutrition gives rise to occasional difficulty. The official suggestion is to enter the observations under the headings of "good," "normal," "below normal," or "bad," but as under-nourishment is the observation of chief importance it would appear that a division into three would be sufficient in ordinary circumstances, thus: "1" might represent good or normal, "3" bad and requiring treatment, and "2" all intermediate states, the majority of which it might be considered necessary to keep under future observation. Health is by no means incompatible with low weight or deficiency of stature, though there should be a fairly normal relationship between the two, and in deciding as to the state of general nutrition a general survey of the child is necessary. Good nutrition necessitates successful physiological processes, and evidence of incomplete harmony may be found in the condition of the skin and mucous membranes, the hair, the general alertness of the child, and defective muscular tone as shown by the stance. In cases of defective nutrition some decision should be formed as to the cause, and among those of chief importance to the medical inspector may be included the possible existence of some chronic disease, the influence of home conditions such as the amount and nature of food or sleep, excessive work out of school hours, and bad habits of the child.

The Recognition of Physical Defects.

The record of these defects will include all deviations from the normal in respect of the different organs of the body. It is difficult to exactly define what should be regarded as a normal standard, and it is therefore not surprising to find that the reports of medical inspectors show considerable differences as regards the maximum

deviation which should be allowed before a recommendation is made for treatment. Where numerous inspectors are engaged in the work conferences materially help to clear up these points, especially when well-defined principles for future action can be agreed upon.

Teeth.—As regards the examination of the teeth, it is necessary to note cleanliness and condition. The possible influence of the milk teeth on the permanent teeth as a consequence of position, decay, or undue persistence is of importance, as is also the relationship between defective teeth and lowered physique and persistent subnormal health. Oral sepsis should be noted and also the existence of such influencing condition as stumps and caries of the teeth, gingivitis, alveolar abscess, and ulcerations of gums, cheek, and tongue.

Nose and Throat.—In the examination of these organs the official schedule suggests that the " presence or absence of obstruction in the naso-pharynx is the chief point to note. Observation should likewise include mouth-breathing; inflammation, enlargement, or suppuration of tonsils; probable or obvious presence of adenoids, polypi; specific or other nasal discharge, catarrh, malformation (palate), etc." Enlarged tonsils and adenoids are the most frequently noted conditions, and at subsequent inspections disappointment is often the lot of the medical inspector in regard to the attention which has been paid to a previous recommendation for treatment. In this connection it will not infrequently be found that the advice given by the medical inspector and the opinion subsequently expressed to the parents by their medical adviser do not agree. Although there may not exist unanimity of opinion as to the importance of the relationship between enlargement of the tonsils and liability to attacks of scarlatina, diphtheria, rheumatism, tubercle, or other diseases; the varying effects on the child of the different forms of enlargements—*e.g.*, chronic inflammatory, or lymphoid type; or the probable improvement after puberty and therefore the relative importance of enlargements in early or late school life, there can be no doubt that cases associated

with deafness, or ear discharge, or in which interference with breathing is obvious, should be recommended for treatment.

The shape of the palate is to be specially noted in the case of mentally defective children, though it is doubted by some whether the relationship between the two is of much importance; it should, however, not be overlooked in arriving at a decision as to the advisability of recommending tonsillotomy or the removal of adenoids; so-called relapses are stated to be most frequently observed when there is a high arched palate and recurrence of the disease tends to discredit the operation.

Diseases of the Eye and Defects of Vision.—In the examination of the eye attention requires to be paid to inflammatory or other abnormal states of the lids and conjunctivæ; diseases of the cornea and lens; and muscular defects such as squint, nystagmus, twitchings, etc. Vision should be tested for each eye separately. It is practically impossible to accurately estimate refractive errors whilst carrying out routine inspections, and although children who cannot read $\frac{9}{12}$ with both eyes, or $\frac{6}{12}$ with each eye separately, should be advised to seek skilled attention, the assumption that no children require treatment who are able to give better results should be guarded against; the high power of accommodation which children possess should not be overlooked, and symptoms indicative of eye strain should therefore be carefully inquired after. Vision testing of children under the age of six years may be omitted, but cases of obvious defect such as squint or corneal ulcer should be recommended for treatment.

Diseases of the Ear and Deafness.—The most frequently observed condition is chronic suppurative discharge. As this is often a sequela of one or other of the zymotic ailments, it is much more commonly found among the older children. These cases present considerable difficulty, for although in many instances the discharge improves after a time, it frequently persists, and children so affected may go through life suffering from an affection which at any time may give rise to serious if not fatal results. Many

cases require to be excluded from school on account of the offensiveness of the discharge. Treatment when advocated will generally be found limited to ineffectual and irregular syringing with various lotions by either the parent or the district nurse. In cases of ear discharge a special effort should be made to induce the parents to be present at the inspection so that the necessity for seeking skilled advice may be impressed upon them. Among cases requiring special notice may be included those in which the discharge is of long standing, or is extremely offensive or sanguineous; in which pain or tenderness is constant or frequent; which show swelling in the region of the mastoid or which are associated with irritative symptoms such as giddiness or headache. These symptoms are not incompatible with more or less regularity of attendance, but the more severe conditions will already have resulted in absence from school and probably in advice having been sought.

In examining the hearing each ear should be separately tested, and defective cases should be presented at the next inspection to ascertain progress. In the case of children under 6 years of age it is only necessary to apply tests in a general way. Children who are too deaf to be taught in an ordinary elementary school should be specially examined and reported upon to the authority with a view to their admission to a special school for deaf children.

Speech.—Observations should include defects of articulation, lisping, stammering, etc. Speech defects are frequently noted among the mentally defective. In the cases of normal children, minor defects of articulation improve in the later years of school life, and this is likewise the case in most instances of idioglossia, in which condition the child has a peculiar speech, using sounds it finds easiest to pronounce.

Mental Condition.—The notes on the official schedule suggest the following division: 1. Bright, fair, dull, backward; 2. mentally defective; 3. imbecile. The first group of children are those who should be educated in a normal school; a special enactment which enables education authorities to deal with children included in the second

group has been passed and regulations have been issued in accordance with the provisions it contains, whilst the children in the third group are outside the scope of an education authority's duties. Generally speaking, ordinary cases of dulness or backwardness are readily classified, but considerable difficulty may be experienced in deciding between the worst cases in one group and the milder cases in the next. It is perhaps advisable as a matter of policy in cases of doubt to give the benefit to the child and classify it among children of the higher grade until subsequent observations enable a definite decision to be arrived at. By Article 53 (*b*) (3) of the Code a school medical officer may exclude a child from attendance, and such exclusion would be deemed "reasonable" if, owing to mental defect, it is incapable of receiving proper benefit from the instruction in the school. Probably very few mentally defective children can receive "proper benefit" in a normal school, but they are frequently allowed to remain in attendance if they are not drafted to a special school or class for the mentally defective, or sent to one or other of the residential schools to which the local education authority contribute. If arrangements do not exist which enable the child to be so transferred, it is perhaps better not to advise exclusion unless the child distinctly interferes with efficient administration. Adequate reasons for exclusion would include the general habits of the child interfering with teaching owing to its not being amenable to the ordinary methods of control, or an intellectual capacity so low that it is not reasonably possible to transfer the child from the lower classes, with the consequence that a boy or even a girl of considerable age might be included in a class of children at say 7 or 8 years of age to the obvious disadvantage of all.

The examination of a mentally defective child is conducted on the lines of the routine medical inspection when the education authority does not exercise the powers contained in the Elementary Education (Defective and Epileptic Children) Act, 1899, and exclusions are effected as already stated, in accordance with Code requirements, but when an examination of such a child takes place under

the powers conferred by section 1 of this Act, it becomes the *duty* of the parent to cause the child to attend an examination if the education authority require it.

Although it is not within the scope of the present chapter to deal with the details of special school work, it may be permissible to refer to Form 41 D.E. issued by the Board of Education. It is my practice to request the head teacher to supply information in accordance with this schedule in all cases which are reported to be mentally defective:

1. Name of child and address.
2. Age.
3. How long has the child attended school?
4. What is the appearance of the child—stupid or bright?
5. Is the child (1) Well behaved; (2) Reasonable; (3) Obedient; (4) Mischievous; (5) Spiteful?
6. Are the habits of the child correct and cleanly?
7. Are the propensities of the child peculiar or dangerous?
8. What is the mental capacity of the child?
   (i) Observation; (ii) Imitation; (iii) Attention and Response; (iv) Memory; (v) Reading; (vi) Writing; (vii) Calculation; (viii) Colour; (ix) Special tastes.
9. Is the child affectionate or otherwise?
10. Has the child any moral defect?
11. Have you any other information bearing on the case?
12. Has the child been in regular attendance? If not, state why.

In addition to this form it is essential that the medical inspectors should report fully on each case of mental deficiency, and that the inquiry should follow some regular method. Unless this is done the school medical officer will find difficulty in arriving at a decision. In such inquiries note should be made of the possibility of severe forms of dulness resulting from adenoids; of backwardness resulting from irregularity of attendance, or from some physical defect of the eye or ear which prevents the child acquiring knowledge; whilst cases of retarded development in consequence of mal-nutrition or general neglect should be differentiated from cases of mental deficiency. Inquiries of the parents should include details of family history such as possible hereditary taint, insanity, epilepsy, various other neuroses, tubercle, alcoholism, and neglect.

The early history of the child should be ascertained as

regards fits, infantile illnesses, accidents, age at walking and talking, and also whether these processes were being normally developed and then suddenly interrupted.

In the examination of the child attention should be paid to the teacher's knowledge of the child as contained in Form 41 D.E. above referred to, making due allowance for environmental conditions in considering general knowledge or apparent ignorance.

The general appearance of the child should be noted as regards health, nutrition, and expression, as should also the presence of physiological anomalies such as defective circulation, dentition and salivation. Speech will frequently be found defective, and the response to simple questions may be prompt or delayed. Excessive, deficient, or incoordinated movements should be noted, and these will be observed in the gait, posture, the facility with which transfer or imitation movements are performed, and in the position of the extended arms and hands. Developmental defects may be found in connection with the ear, eyes, nose, lips, tongue, cranium, palate, jaws, teeth, limbs, and skin. The power of reasoning, concentration, attention, and observation, and also memory and imagination should come under review, and inquiries made which will elicit information on such matters as truthfulness, outbursts of temper, viciousness, general morals, interest of the child in games and amusements, matters of occupation, age of playmates, and whether morose or the reverse.

Complete absence or defective organisation of the cerebral centres regulating the faculties of hearing, sight, speech, or writing, or want of continuity of the fibres connecting these centres, may result in various intellectual deficiencies, such as more or less interference with the power of reading, and of writing to dictation in cases of congenital wordblindness, and the inability to understand words heard in cases of word deafness. These children require careful additional investigation.[1]

Many cases of congenital word blindness are otherwise

[1] See article on "The Aphasias of Childhood and Educational Hygiene," by C. J. Thomas, M.B., D.P.H. *Public Health*, No. 3, vol. xxi., May, 1908.

quite intelligent. They are found most frequently in the lower classes owing to their making slow progress. They may be either quite unable to read, or they read very badly and constantly mistake words and letters. Writing to dictation may be impossible, or the task may show not only bad spelling but a combination of letters which does not even approximate in correctness the word for which it stands. Words spoken are understood, and the power of speech is unimpaired, so that although a written word may not be recognised the same word spelt aloud may be pronounced and its meaning appreciated. The child may be capable of performing problems in mental arithmetic, and arabic numerals are correctly recognised.

Cases of congenital word deafness are not common; the first case was described and explained by Dr James Kerr in 1900.[1] Words are heard but not understood. Speech is not possible except when the faculty of lip-reading has been acquired. By this means simple instructions may be understood or the names of certain every-day articles learned, in which case a request to "pick up a pencil" might be ignored, but a pencil given to the child might be correctly named. Cases of word deafness resemble deaf-mutism, which also acquire the power of lip-reading, but they differ from them inasmuch as the pitch and articulation of spoken words may nearly approach the normal which is not the case with deaf mutes.

Defects of internal organs.—It is highly probable that the inspection as carried out up to this point will have provided a clue to the presence of disease of the internal organs where such exists, and if in addition the chest is now sufficiently exposed to enable the apices of the lungs and the precordial region to be auscultated, it does not seem probable that many instances of serious disease will be overlooked. A mistress or nurse should always be present at the inspection of girls.

It is among the group of "internal diseases" that defects previously unsuspected are discovered, and recommendations to both parents, teachers, and the local education

[1] KERR, J.: *British Medical Journal*, 1900, vol. i., p. 1,231.

authority will be frequently required. Total or partial exclusion from school will be granted in respect of many children suffering from diseases of the heart or lungs. In the case of the various forms of tuberculosis all cases in which the disease is present in an active state should be excluded for treatment; the result of negligence of the physical state will prove much more disastrous than any interference with the educational course. In the case of a school where many children present abnormal physical signs in the chest, any recent epidemic prevalence of whooping-cough or measles should not be overlooked, and the relationship of such an event to the observed facts duly considered. Children suffering from epilepsy may be justifiably excluded when the fits are frequent, or when they present an altered mental state such as inability to learn, or a general demeanour which interferes with school discipline. In the latter case a detailed report containing the circumstances of the case may well be requested of the head teacher, and in all exclusions the desirability of recommendation to an institution for epileptics should be considered. Cases of marked anæmia, chorea, or nervous strain require exclusion, and temporary absence at the menstrual period may require approval in certain cases among elder girls. Anæmia is given as the reason for absence of many girls who are within twelve months of the statutory age of leaving school, and it is advisable that an attempt should be made to ensure the presence of all such children at the routine inspection.

In districts where provision is made for the treatment of cases of physical defect in special schools, many suitable cases will be found among those suffering from heart diseases, tuberculosis of bones or joints, deformities due to rickets or paralysis, and also among children who, whilst not suffering from any definite disease, present conditions of extreme debility or defective nutrition. Where no such special schools exist it may be necessary to recommend the education authority to provide suitable school furniture or appliances in cases of deformity or paralysis.

Total exclusion from drill or some modification of the

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course may be necessary in cases of hernia, heart disease, general debility, or physical deformities. Definite instructions should be given to the head teacher, and corresponding notes entered on the inspection card. Physical training is assuming greater importance in the school curriculum, and in the near future it may be possible to recommend suitable remedial exercises in certain cases of spinal curvature.[1]

The existence of several cases of cardiac irritability and perhaps dilation, among boys, may suggest an inquiry into habits or objectionable practices, and in most cases of apparent nerve strain, an inquiry into the home-life of the child would be advisable, as in these ways important contributing causes may be brought to light.

In addition to the above requirement of the official schedule, space might advantageously be provided for (*a*) observations of the teacher respecting any matter of importance in the health history of the child, mental or physical, arising in the inter-examination period; and (*b*) for a brief report by the head teacher in the case of transfer of a child from one school to another respecting any marked peculiarity of the child, or other matter of interest which might prove of value to the new head teacher.

Certificates of Exclusion.

By Article 53 (*b*) of the Code provision is made for excluding children from attendance at school on account of the following conditions—(*a*) to prevent the spread of disease, (*b*) on the ground that their uncleanly or verminous condition is detrimental to other scholars, and (*c*) on the ground that owing to their state of health or their physical or mental defects, they are incapable of receiving proper benefit from the instruction in the school.

It should be noted that "no child may be refused admission to a public elementary school on other than reasonable grounds," and the above regulations are intended to place exclusions so effected on the basis of "reasonable"

[1] See Prefatory Memorandum to the Syllabus of Physical Exercises issued by the Board of Education for Public Elementary Schools. London: Wyman and Sons Ltd., 1909. 9d.

exclusion. A certificate granted by a general practitioner stating that a child is suffering from illness is simply the parents' justification for keeping the child from school, whilst the import of the certificate of the school medical officer is, that it legally bars the child's attendance at school in the event of the parent considering the child is not suffering from an ailment which justifies exclusion.

Exclusion certificates might with advantage be made out by the medical inspector on a triplicate form, using two carbon sheets. One copy should be retained by the teacher to satisfy the school attendance officer and the managers, one should be retained by the medical inspector, and the third should be forwarded to the school medical officer, who will approve the exclusion in suitable cases, and either file the copy at his office or forward it to the clerk to the education authority as may be arranged, no correspondence with the teachers being necessary in ordinary cases which are approved.

Certificates received from the medical officer of health requiring exclusion of infected children or contacts should be at once complied with, and the same should be forwarded to the school medical officer for endorsement. Although compliance with these requests for exclusion is only compulsory when forwarded by the sanitary authority or under the signature of any two members, it would be inadvisable to require any more formal procedure in these cases than the certificate of the medical officer of health.

Exclusion certificates granted in respect of cases of mental deficiency and likewise for permanent exclusions on account of physical defects should be accompanied by a full report on the circumstances of each case. Exclusions on account of some temporary disability should have a definite period of exclusion stated on the certificate, which can afterwards be extended if found necessary.

In cases of uncleanliness or verminous conditions an exclusion certificate stating the period of exclusion—which should be one within which the parents might reasonably effect a satisfactory improvement in the child's condition —and formally approved by the school medical officer, is

probably essential to successful legal proceedings being undertaken by the managers against the parents in cases of prolonged absence from school on account of these conditions.

Equipment for Medical Examination.

In order to carry out the work of medical inspection certain appliances are necessary.[1] These will include weighing machines, height standards, ordinary tape measures, eyesight testing cards, and boxes in which to

[1] The apparatus required for use in connection with the medical examination of school children can be obtained from the following firms :—

The Educational Supply Association Ltd., Holborn Viaduct, E.C. ;
Messrs. E. J. Arnold and Son Ltd., Butterley Street, Hunslet Lane, Leeds ;
Messrs. Philip and Tracey Ltd., Norwich Street, Fetter Lane, E.C. ;
Thomas Wyatt, 279, Deansgate, Manchester ;
The Central Educational Co. Ltd., St. Peter's Street, Derby ;
The National Society, Sanctuary, Westminster, S.W. ;
The Midland Educational Co., Corporation Street, Birmingham ;
John Heywood Ltd., 121, Deansgate, Manchester ;
Messrs. A. Brown and Sons Ltd., Farringdon Avenue, E.C. ; or from almost any of the recognised scholastic supply houses.

The following are manufacturers of various apparatus used in the medical examination of school children :—

Weighing Machines.
W. and T. Avery Ltd., 14-17, Cowcross Street, E.C.
The Fairbanks Co., 78-80, City Road, E.C.
Bartlett and Son Ltd., 101, Great Tower Street, E.C.
Day and Millward Ltd., 39, Duke Street, Aldgate, E.C.
Henry Pooley and Son Ltd., 89, Fleet Street, E.C.
Geo. Salter and Co., 101, Leadenhall Street, E.C.

Height Measuring Standards.
R. Mather and Son, Shoreham Street Works, Sheffield.
Aston and Mander Ltd., 61, Old Compton Street, Soho, W.
I. and D. Smallwood, Leopold Street, Birmingham.
E. Preston and Sons Ltd., Whittall Works, Birmingham.

Eyesight Testing Cards.
The Educational Supply Association Ltd., Holborn Viaduct, E.C
Chas. Baker, 244, High Holborn, W.C.
Curry and Paxton. 195, Great Portland Street, W.
F. Davidson and Co., 29, Great Portland Street, W.

Metal Boxes.
Robert Tann, London Fields, Hackney, N.
Geo. Wright and Co., Bayer Street, E.C.
R. Mather and Son, Shoreham Street Works, Sheffield.
Geo. Harding and Sons Ltd., Long Lane, Borough, S.E.
James Reeves, Sons Ltd., Boundary Street, Shoreditch, E.
B. Perkins and Son, 179, Bermondsey Street, S.E.
John Tann, 11, Newgate Street, E.C.

Wooden Tongue Depressors.
Ingram, Perkins and Co., 37, Beech Street, Barbican, E.C.
Cobbett's, Virginia Road, Bethnal Green, E.
The Young Firm, Virginia Road, E.

store the inspection cards. In addition, suitable vessels in which to hold disinfectants should be provided, as well as two lavatory basins, a supply of water and one or two clean towels. Wooden tongue depressors, which can be bought at 5s. per 1,000, have an advantage over metal or glass ones when facilities for sterilisation are limited. Weighing machines should have good bearings, and be devoid of decorative embellishment; they should be kept in a box or locked cupboard. Appliances which will wear well and remain reliable under constant usage are expensive, and education authorities are apt to view critically a suggestion that every school should be supplied with this requirement. In some districts a limited number has been provided, and the inspector either takes or sends one to the school previous to his visit, or one is kept at a central place, and children who are to be inspected are sent at a convenient time to be weighed. Objections on the ground of expense likewise apply to the general provision of height standards, though with less force as they are cheaper. It seems probable that the physical progress of the scholars will be regarded in the future as almost of equal importance to educational progress, and if teachers are to be encouraged to take more than a casual interest in this work it would appear to be just as necessary that each school should be supplied with these essentials as with ordinary educational requirements. A cheap and efficient standard consists of a simple graduated boxwood rod with bevelled edges, which can be screwed to a door; the sliding horizontal piece can be taken off and stored until required. It takes up no room and is practically in no danger of being broken, it has also the advantage of being cheap and efficient. Eyesight testing appliances will, for routine inspections, be limited to a series of test type, as it is hardly to be expected that an attempt to correctly estimate the refractive error will be undertaken at the school. The provision of a suitable test card for each department is desirable, as head teachers should be encouraged to periodically test the vision of each child in the school and to ascertain the acuity of vision of scholars whose progress seems disproportionate

to their intellectual capacity. A card which has certain advantages over the single sheet of Snellen's type is one which consists of a circular white disc about eight inches diameter on which are placed radially six series of test-type. Each series consists of three sizes, beginning at the centre with type which should be read at twenty feet, whilst the outer two should be read at thirty and forty feet respectively. The circular disc is fitted behind a cover out of which is cut a V-shaped piece; in this space one of these series of type is exposed, and as the cover is not so wide as the circular piece this can be easily moved so as to expose the different series. It has the advantage of preventing the children committing the type to memory, and readily enables any child with vision worse than $\frac{20}{40}$ to be selected for further examination.

The actual cost of each of these different articles to the Kent Education Committee was as follows: Weighing machine in box, 29s. 9d.; height standard, 2s. 8½d.; eyesight testing card, 10d.; and metal boxes to contain records, 3s. 9d. and 4s. It should be remembered that these requirements were purchased through the Stores Department of the Kent Education Committee, which is recognised among manufacturers as a wholesale trade house.

The Conduct of the Medical Examination.

By Article 58 (*a*) of the Code it is necessary for the managers of schools to give such reasonable facilities as are required by the local education authority for the purpose of medical inspection; it is not easy to see in which direction serious difficulties might arise.

Paragraph 8 of Circular 576 directs attention to the desirability of enlisting the hearty co-operation of the teachers, and suggests that "some authorities will find that the teachers are able to undertake, without undue strain, a share of the work of furnishing data respecting each child, and even perhaps to carry out some portion of the inspection." This suggested co-operation is possible in respect of the following matters:—

The head teacher, on receiving notice from the medical inspector of his proposed visit, should inform the parents of children mature for inspection of the date and hour of the inspection, and at the same time transmit the inquiry form relating to the previous health history of the child. Suitable printed forms would be supplied to the teachers for both these objects. The information thus obtained as well as the name, age, and date of birth of the child, and standard and attendance should be entered on the card by the head teacher. As regards the items respecting cleanliness of person, and sufficiency and cleanliness of clothing and footgear, it will be found that the condition at the time of the inspection will frequently not represent the usual state, and therefore the teacher's entry would be more reliable than the medical inspector's. These matters have more than a medical interest; they are of the greatest concern in school administration, and such entries might be regarded as the teacher's report to the medical inspector.

Nutrition is a somewhat technical term, but teachers might be encouraged to make an entry respecting it though it should not be made compulsory, and where the attempt is made the entry should be checked, any difference of opinion being made the subject of interview.

Entries respecting height and weight might well be undertaken by the head teacher. In this way each child comes under direct observation, and important deviations from normal are emphasised which will stimulate additional future observations being undertaken apart from routine inspections. It is unnecessary to ascertain the height and weight of all children twice or even once a year, though this may well be done in a few schools for the purpose of creating standards. These additional observations are being made in three schools in my area, and it may be of interest to note that in one, the work is regarded as part of the educational course. A card is allotted to each child, on which height and weight are graphically recorded, and each class is taught to plot out on a large sheet the progress of the various members of the class, different colours being used to indicate the periodical progress which each

child has made. The children carry out the details under the supervision of the head teacher.

The official opinion[1] is expressed that the inspection of each child should not occupy on the average more than a few minutes, and with the assistance of teachers as above outlined my experience is, that in a school session of two hours, an average twenty children may be examined in the senior school and twenty-five or more in the infants.

In carrying out the inspection there are certain regulations[2] which require to be observed: "The inspection should be conducted in school hours, and on school premises, and in such a way as to interfere as little as may be with school work," and "the convenience of the teaching staff and the circumstances of each school must receive consideration."

It is also recommended[3] that one or both parents should be encouraged to be present at the first inspection. This is very desirable since the mother may facilitate the examination of infants by overcoming their natural objection to inspection, and her presence affords the inspector a means of obtaining information which might not otherwise be possible; it also gives him an opportunity for removing any misconceptions as regards the scope and object of the inspection if such exist.

For purposes of inspection a class-room is generally available in the larger schools; in the smaller schools with only two rooms, one for the mixed department and one for infants, it will generally be most convenient to use the smaller infant room and to temporarily transfer the children to the main room. In the case of schools of only one room suitably disposed screens or curtains will generally be found sufficient. In these latter schools the work will not cause interruption for any considerable length of time, as the number of scholars presented will generally be few, and in fine weather physical exercises in the playground by part of the scholars will generally sufficiently relieve the

[1] Circular 582, paragraph 5.

[2] Circular 576, paragraph 13.

[3] Circular 576, paragraph 12.

congestion and provide space for inspection work. Interruptions of secular education for the purposes of medical inspection are provided for by the Code, but if none of these alternatives are possible the inspection should be arranged for off the school premises, and the sanction of the Board of Education obtained.[1]

As regards the children submitted for inspection, it is advisable to present them in age groups, and of course boys and girls should be inspected at different times. There is considerable variation in the manner of conducting the inspection; in some districts each child is separately inspected, whilst in others all the children of one age group and sex are present whilst the inspections of that particular division are in progress. I favour the latter, and I find it of advantage not to complete the inspection of one child as regards the full schedule of particulars before going on to the next, but to divide the inspection into four chief divisions. Each child carrying its inspection card first comes up for consideration respecting articulation, breathing, teeth, tonsils, adenoids, and enlarged glands, any deviation from normal being noted before the child passes on. A piece of writing-paper and a pencil are now given to each, the children are told to face the wall, and to write down a few words dictated by a teacher with whom they are acquainted and who speaks in a voice somewhat below normal, from a point, as near as can be arranged, which is equi-distant from all. This written test will be found helpful at times. The children are then separately examined as regards the condition of the ears. They are next examined with respect to eye diseases and vision. Some children who are shy at pronouncing letters will readily write them down, so to ensure confidence they are examined in groups of four, and are asked to write down the three test letters exposed on the test card, which is placed at a distance of twenty feet. The results are noted and each eye is now tested separately; the head teacher stands near the test card, and rapidly moves a new series of letters into position as each eye is separately examined.

[1] Education Code, 1909-1910. Article 44 (*h*).

Children presenting abnormal conditions are readily discovered, and they may be submitted to further detailed examination.

Whilst this part of the examination is in progress, those who have been through the test prepare for the examination of the chest by loosening the upper garments. The nurse or teacher present supervises this preparation. After each has now been inspected, the inspector retains the card; the children adjust their garments, those requiring a more detailed examination being privately examined. This procedure saves time since the children are able to help one another, though some variation is necessary in respect of the inspection of infants, as one crying child has a tendency to upset the whole class.

After the actual inspection and when the cards have been collected, necessary advice is given to the parents, instructions are given to teachers, certificates of exclusion are written out, and if a nurse is present she should be given her directions respecting cases which should be followed up, and in those instances where local committees exist to carry out ameliorative work a list of children should now be prepared to which their attention might well be directed.

The Registering of Results.

As the Board of Education have not insisted on identical arrangements of medical inspection in all areas, but only on certain general principles, leaving local authorities to arrange the details as local circumstances seem to require, it is probable that there are no two schemes which do not differ in more or less important particulars. Considerable variation will be found in the methods of keeping the records of inspection, and the following represents a system which has been found to be reasonably efficient:—

(*a*) *In the School.*—The cards of all children are kept at the school in a suitable metal box provided with a lock. This box is divided into a certain number of compartments which vary with the type of school. The cards of children

are grouped according to ages, the age being regarded as that which the child will attain between January 1st and December 31st, and each group is alphabetically arranged. Two colours are used to allow of sex differentiation. The box for infants' departments is divided into five numbered compartments to hold the cards of children of the following ages:—

Children under 5	5	6	7	Children over 7

For mixed schools the boxes have seven compartments, which are numbered from 7 to "13 and over," and in "mixed schools with infants" an additional compartment is provided for "infants." If the latter school has a large infants' division a separate box is supplied to each division, and in the largest mixed schools separate boxes are supplied in which the cards of boys and girls are stored separately.

At the commencement of the work a card was made out for each child in the school and on it were included name, address, and date of birth; the many exceptional cases are thus provided for, and since the children are dispersed through different classes at different ages this grouping tends to prevent any being overlooked; the head teacher's time is also saved at the time of routine inspection since much careful searching of registers may be avoided provided that a card is always made out for a child at the time of admission, and that one is obtained in the case of a child transferred from another school. The cards have to be moved up one compartment each year, and on the schools re-opening after the Christmas vacation the cards in the final "13 and over" compartment—which correspond to children leaving school—are removed and stored, thus enabling all other cards to be moved up one division, and leaving the first space for the cards of seven-year-old children who will at a later date be transferred from the infants' department.

In each compartment is a distinctively coloured guide-card which is used to differentiate normal from abnormal

children : this serves a useful purpose, and readily indicates those children who require more frequent inspection.

(*b*) *Office Work.*—The cards of the children who have been inspected are sent to the office, and the details on each transferred to loose sheets ruled horizontally to contain twenty-four names, and vertically to correspond with the different items on the inspection card. A separate sheet is used for each age and sex in each school, and the totals obtained for each group are transferred to similar summary sheets, from which a monthly total is prepared for presentation to the Education Committee in a conveniently arranged form. The totals of these monthly summaries represent the statistical statement of the year's work. To facilitate reference to the current year's work the different age and sex sheets referring to the children in each school are enclosed in an ordinary folder, and ten of these folders representing ten schools are filed in a suitable box. At the end of the year these records are removed from the boxes and filed vertically, each school separately. Each year the new series of inspections will be added to each school whilst the forms referring to " leavers " will be removed and stored.

I believe this method will provide a very ready way of following the history of groups of children through the different ages at which they mature for inspection, and at the same time will not render the finding of particulars referring to children who have been inspected a matter of much trouble.

The filing of correspondence and of other details incidental to inspection work is carried out in drawers of a size which will carry " brief " paper. By means of stiff cards the available space in these drawers is divided equally among the schools—four drawers are used for 450 schools. The division card has on its upper edge a projecting piece which carries the name of the school; these projections have a progressive position on five successive cards, which facilitates the view of the name. Between each pair of division cards are four folders, likewise with " stepped " indicators; the first one, marked " Correspondence," con-

tains all letters with reply attached referring to matters specific to that school; the second, marked "Sanitary Survey," contains any observations of H.M. Inspector on the state of the school, the medical inspector's report on the sanitary condition, a copy of the report of the school medical officer to the secretary of the Education Committee for transmission to the managers, and the managers' observations which are received later; the third folder, marked "Closures," contains particulars respecting school closures and reports on such matters as the prevalence of infectious disease; and the fourth, marked "General," contains special reports called for respecting the health of the scholars as a whole at any particular school, press-cuttings referring to reports of managers' meetings, and various other matters of interest not otherwise classified. General correspondence relating to school work as a whole and not specifically referring to any one school is not filed in this series, but in the usual manner—letter and reply—indexed under names.

The above represents an attempt to obtain continuity of observation, and to so group the records that the details respecting each school may be immediately available for either general or particular inquiry or comparison. As regards the daily routine, administrative difficulties chiefly arise in consequence of various persons having responsibilities at different stages of the work, and from the considerable amount of clerical work in which these persons are involved in carrying out the necessary formalities. In order to minimise these difficulties, attention should be given to the following points:—

(*a*) *Uniformity.* In large districts in which are included schools of various size, absolute uniformity in every detail is essential if the work is to be productive of the best results and kept within reasonable and practical limits. To effect this end a complete series of regulations should be drawn up which will clearly indicate the responsibilities of each person concerned in the work. These regulations should be supplied to school managers, head teachers, and medical inspectors, and although it is impossible to antici-

pate every difficulty which may arise, those which have been solved and in respect of which a line of action has been decided, should form the basis of future supplementary regulations.

(*b*) *Routine Work.* The scheme of work in respect of routine inspections should be arranged for definite periods, and the work to be undertaken in that period, whether it be one of three, six, or twelve months, should be clearly stated and communicated to both teachers and medical inspectors. A precise knowledge of what is required facilitates the work of teachers and results in much saving of time at the inspection, and the avoidance of unnecessary cases being presented.

(*c*) *Forms.* The number of forms which are absolutely necessary for the work is so considerable that additions to the series should be avoided as far as possible. A multiplicity of forms tends to create confusion and to require time being devoted to clerical details which might with advantage be transferred to practical work.

In this chapter the writer has endeavoured to describe mainly the results of his own experience in regard to the organisation and administration of medical examination, believing that a record of methods which have proved satisfactory in a large and varied district is likely to prove of greater service to others than a mere patchwork account of procedures adopted in the 328 districts of the local educational authorities now existing in England and Wales.

REFERENCES.

All serious students of the subject should consult the official publications of the Board of Education, especially the following[1]:—

Code of Regulations for Public Elementary Schools in England (excluding Wales and Monmouthshire), with Schedules, 1909 [Cd. 4735]. 3d.

[1] All official documents issued by the Board of Education as well as other Parliamentary Papers may be obtained from Wyman and Sons Ltd., Fetter Lane, London, E.C., and 32, Abingdon Street, Westminster, S.W.; or Oliver and Boyd, Tweeddale Court, Edinburgh; or E. Ponsonby, 116, Grafton Street, Dublin.

Regulations applicable to Schools for Blind, Deaf, Defective, and Epileptic Children [Cd. 3636]. Modifying Minute, June 30th, 1908 [Cd. 4165]. 3d.

Memorandum on Medical Inspection of Children in Public Elementary Schools, under Section 13 of the Education (Administrative Provisions) Act, 1907 [Circular 576], 1907. 2d.

Circular on Details of Medical Inspection with Specimen Schedule for Report on Child [Circular 582], 1908. 2d.

Circular on Medical Inspection, including functions of School Medical Officer, Local Education Authority's Report, etc. [Circular 596], 1908. 1d.

Memorandum on the Education (Administrative Provisions) Act, 1907, except Sections 13 and 16 [Circular 577], 1907. 1d.

L.G.B. Memorandum on Closure of and Exclusion from School, 1909. 2d.

Circular to Local Education Authorities relating to the revision of the Regulations affecting the staffing of Public Elementary Schools, and the size of Classes [Circular 709], 1909. 1d.

Report of the Consultative Committee upon the School Attendance of Children below the age of five [Cd. 4259], 1908. 1s. 5d.

Reports on Children under five years of age in Public Elementary Schools by Women Inspectors of the Board of Education [Cd. 2726], 1905. 8½d.

Report of the Consultative Committee on Attendance, compulsory or otherwise, at Continuation Schools [Cd. 4757], 1909. 1s. 6d.

Special Reports on Educational Subjects—Vol. 21: School Excursions and Vacation Schools [Cd. 3866], 1907. 5½d. Vol. 22: Provision made for children under compulsory school age in Belgium, France, Germany, and Switzerland [Cd. 4477], 1909. 1s. 3d.

Educational Pamphlets—No. 4: "School Doctors in Germany." By W. H. Dawson, 1906. 6d.

In addition to the above, careful study should be made of :—

The Annual Report for 1908 of the Chief Medical Officer of the Board of Education, 1910 [Cd. 4986]. 8½d.

For a clear understanding of the evolution of the movement which has secured medical examination in our public elementary schools it will be necessary to refer to many papers and reports of discussions in the *Lancet*, the *British Medical Journal*, *Public Health*, the *Journal of the Royal Sanitary Institute*, the *Medical Officer*, etc., during the last four years. See also papers on " Medical and Hygienic Inspection in Schools " in " Transactions : Second International Congress on School Hygiene, London, 1907," vol. ii. London : Royal Sanitary Institute, 1908. 5s. each vol.; 12s. 6d. set of three vols.; bound, 15s. net.

IV

MEDICAL EXAMINATION OF BOYS IN PREPARATORY AND PUBLIC SECONDARY SCHOOLS

BY

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PUBLIC thought in this century is profoundly charged with educational problems and attempted solutions, and the gravity of the questions propounded still demands renewed inquiry. In other sections of this book overwhelming evidence is adduced regarding the care and forethought which are now expended upon the health and adequate education of children in the primary schools of Great Britain. What is the case as to our private, preparatory, and public secondary schools for boys?

HISTORICAL AND GENERAL CONSIDERATIONS.

While the Royal Commission on Secondary Education was sitting in 1894, I was asked by the ancient and honourable Corporation of the College of Preceptors to address them upon the "Inspection of Schools."[1] Keenly interested, as I have always been, in the training of the young of both sexes for physical, mental, moral, and social service in the world, I regarded the occasion as a valuable opportunity for speaking directly and indirectly to those who devote their lives to the noble object of education.

[1] DUKES, C.: "The Inspection of Schools from the Medical and Sanitary Point of View." Rugby: A. J. Lawrence, 1894. 1s.

In the discussion which followed, a teacher adverted to the hopelessness of even *attempting* to effect many of the reforms I had advocated. In reply I expressed the belief that the very first school master to embody the proposals in "practice" would be the exceedingly thoughtful speaker who was staggered by the suggestions I had submitted for the adequate training of the young.

Changes in such a sphere must necessarily be gradually adjusted—not summarily introduced—to the natural growth of youthful body and mind, in order to ensure the steady and normal development of the individual. As a nation, we have made extraordinary advances in recent years in the modern mental education of the young—advances too often, in my judgment, in excess of brain capacity, and consequently detrimental to brain development—for we have frequently forgotten, through partial attention only, the well-being of the child as a whole; his future, in its completeness, thus being sacrificed to present pressure. It is almost inconceivable that it should not occur more constantly to parents and teachers that the primary aim in the early stages of education must obviously be directed to the development of the entire framework at the only period when plasticity can co-operate with our efforts. For, unless this course be pursued, the nervous energy required in the process of physical growth is consumed by the over-active brain.

The Physical Examination of Schoolboys.

At the close of the last century many were astonished at the propositions which were then suggested for the advancement of education, and the care of the child. And now, in the first decade of the twentieth century, I am myself amazed at the extent of the modifications and innovations which have been accomplished, and no feature has created greater surprise than the organisation of the medical examination of the children of the primary schools of this country.

In a matter of this importance the great secondary

public schools of Great Britain, where boys are educated from 13 to 19 years of age; the preparatory schools, where education is provided from the age of 9 to 13 years as a passport to the former community; and the high schools for girls, cannot afford to remain stationary—for stationariness in this province means retrogression.

In the year 1899 the governing body of Rugby School acceded to my request by making arrangements for the physical examination of all boys at entrance. This distinguished body had, therefore, the honour of being the first to institute this procedure. In how many of the above-mentioned class of schools, I ask, is this course followed? And yet it is the common practice now in all primary schools! And I, further, ask this pertinent question: Is this physical examination less necessary for those who come from wealthy homes, brought up in luxury, and on whom every expense has been bestowed since birth—expense often so unadvised in nature that, instead of fostering that robustness of physique and character, which the work of mature life will demand, delicacy of body, and inertness of mind have been induced? We are evidently nearing the goal, for the Association of Headmistresses, which represents girls' public secondary schools of every type, in October, 1909, passed a resolution that governing bodies should require a medical inspection in the case of all children entering their schools.

Results of Physical Examination.

At the International Congress of School Hygiene held in London in 1907, I recorded,[1] by the kind permission of the head master, the result of the physical examination of one thousand boys at their entrance on public school life. A consideration of the facts then tabulated will show to all thoughtful parents and educationists the imperative necessity of physical examination in this class of schools.

[1] Dukes, C.: "A Record of the Physical Examination of One Thousand Boys at their Entrance on Public School Life." Transactions of Second International Congress of School Hygiene. Vol. I., p. 325. London: Royal Sanitary Institute, 1908. 5s.; 12s. 6d., 3 vols.

Reasons for Medical Examination.

The aim in all schools is that the *sound* boy shall not leave school weakened in mind, body, or character by the system in practice; and that the *delicate* boy (for the days have passed when it was considered that the robust alone could survive the ordeal of a public school) shall, by well-devised methods, be invigorated during that period of his life. Suitable exercise must be arranged for boys of this type—the need is the greater the more pronounced be the delicacy. No boy should be denied exercise appropriate to his capacity at the caprice of a parent; and the doctor, whom the parent consults, still too frequently fails to realise the injury which abstention from games will produce upon the boy by his subservient acquiescence in the parent's whim.

The physical examination of boys at school is a question of the first importance to the nation; for if it be efficiently performed not only will the boys of the present generation reap the benefit of a happier boyhood, but, as adults, they will become fully fitted for their work in the world. The physique of every generation, and the consequent vitalising of the nation, depend mainly upon the rightly-directed physical education of the young of the previous generation. It is an indisputable fact that the blessing and power of energetic manhood can only be obtained in a marked degree by a healthy and happy childhood and youth, which inefficient nurture and training not simply impede but prevent.

In the careful consideration of the welfare of the boy at school, and of the general direction of the individual life, it must be borne in mind that exercise of function is not only essential to growth and development, but also to the healthy maintenance of the brain and the body and their normal equilibrium. In the performance of work, whether mental or physical, energy is expended and finally exhausted, and this end arrives sooner in the young, who are deficient in staying power, than in those whose tissues are matured.

The strain and severity of the work can only be accurately gauged when age is taken into account. The younger the boy the more disastrous is the effect of mental or physical pressure, which lays a sure foundation for the development of neuroses—the bane of this century—thus marring not simply the entire life of the individual affected but that also of others who hereafter become dependent upon him.

On his entrance into school life, the boy has usually to undergo a searching *mental examination* with the view of ascertaining whether his knowledge is sufficient to sanction admission to the school, and, according to the standard he is found to have reached, of determining the "form" or "class" which he should be placed. By this means tasks are not imposed which are unsuited to his capacity, and a fair knowledge of his working powers should be gained.

A *physical examination*, equally searching, should be adopted in order to ascertain what he is fit for physically, what will increase, what retard his physical growth; and what will enhance his vigour. In this way a fitting stimulus can be imposed upon the boy who is lazy; while where energy is disproportioned to his strength he can be restrained in ardour. Also suitable exercise can be assigned to those of inferior health and physical power, and on whom greater attention should be bestowed. This may tend to the alleviation or removal of their delicacy.

It is evident, then, that the outdoor life of boys requires adjustment according to age, size, and physique, and the necessity of graduated exercise, with the object of adequate development of the body according to individual needs, is thus indicated. The physical examination should be as thorough as that for life assurance.

Physical examination for school purposes is merely relevant to the pupil's physical fitness for the adequate endurance of school training during the ensuing five to ten years. It reveals his vigour and defects, his vulnerability to disease, his capacity for work and play, and thus discovers the pitfalls which require to be avoided in order that a maximum of health may be attained, and a durable foundation laid for vigorous future development.

On the corresponding examination for life assurance the viability of the applicant is the essential question to be determined; while in the physical examination for the public services the requirements of the State involve, in addition to soundness of constitution, an estimate of the probable duration of efficiency, and of the extent of the liability for pension, so far as medical foresight can approximately assign. Equally in the examination for assurance and Government service the hereditary tendencies, and family longevity, are of paramount importance. In the public services, especially in the examination of Naval cadets, who enter at very early ages, hardship sometimes occurs in consequence of the unfinished growth of the candidate, for some boys start growing comparatively late. Late physical development, however, often proves the more stable, by reason probably of the longer period over which it extends, and the more solid conformation which it thus secures.

Fortunately, in the present day, it seems to be becoming generally recognised by parents, masters, mistresses, and legislators that physical exercise—especially in the form of school games—is not simply valuable, but essential, in the effective rearing of the race—valuable, that is, from the mental, moral, and physical aspects, with lamentable consequences if it be neglected or omitted.

Mental education is pressed to its extreme limit of endurance in all cases, and transgresses this limit in those deficient in stamina. This tendency must be counterbalanced by a deliberate method of physical education, whose aim shall be the just equipoise of both disciplines. Harmonious concurrence in the development of mind and frame will thus—and only thus—be secured, and the individual be benefited as a whole. He forms an entity, and the twin constituents of this entity must be maintained in equilibrium.

In considering the welfare of the boy, the physical conditions which are necessary for mental effort, and the modes of securing or thwarting those conditions have not hitherto received sufficient recognition. And the medical

and hygienic inquiry insisted on for all children in all classes of schools, it need scarcely be added, is not only related to the promotion of a sound intellectual state, the easier acquisition of knowledge, the clearer perception of its application, and the gradual appreciation of method, in place of mechanical and unvaried rules, but bears a definite relation also to the moral development of character. So that the medical examination is a valuable asset in the hands of the educator, which should be utilised from the beginning of school life.

The Conduct of the Medical Examination.

As the physical examination involves considerable time, and can only be efficiently conducted in daylight, it should be commenced at the opening of each term, in order that the details of the examination may be speedily in the hands of masters as a guide to the organisation of games, and gymnastic exercise to be prescribed for each boy, and as a substantial aid also to the extent of work which can safely be imposed.

It is of the utmost consequence that, at the time of the physical examination, the medical examiner shall be in possession of a medical report of the previous health of the boy, with all the important details of his family history—in fact, his life history.

For, although the boy may be sound, there may be inherent defects in his constitution or health resulting from previous severe illness, or derived from family predisposition to disease, which would guide the decision of the examiner as to the nature and extent of his physical education. Indeed, the question to be decided is, not merely is he sound, but is he vulnerable in any special way that requires protective measures? If these points receive due consideration, there will generally be found a small number of boys, even of those who are in apparently good health, for whom certain games must be selected; for instance, boys with a tuberculous, personal or family, history: those who have recently had a severe or prolonged illness; those who have undergone an operation lately;

those who have grown beyond their strength; those who have failed to attain the normal weight and stature; and those with heart disease, who require unceasing care for compensation of the walls of the heart during the period of its growth, which can only be secured by a judicious choice of exercise. Of such importance is this knowledge for effectual guidance that I have never attempted to make my physical examination without this medical report before me.

Having then studied the life history, and made a complete investigation of the present condition of the boy, the medical examiner is in a position to certify the amount and character of the physical exercise which is adapted to his state.

He should then prepare the official form, on which are named the school games, indicating those in which the boy should join, and thus afford the master an efficient guide in the physical training. Thus checked no boy can shirk his appropriate and assigned exercise.

The strong, hearty boy requires no instructions: the lazy, indolent one will be apportioned his suitable games, in which probably he will eventually take an interest; while the delicate boy's exercise can be properly allotted, supervised from time to time, and increased as his vitality improves, with, in all probability, the ultimate eradication of his delicacy.

But this medical examination on the entrance into school life is insufficient in itself: medical supervision throughout school life must be exercised. I do not mean when boys are ill—supervision at that time they usually receive; but I refer to medical oversight from time to time, with a view to ascertaining that the current system of physical education is not producing a baneful effect. For this purpose a complete repetition of the physical examination is non-essential, nor is it advisable, as certain indications furnish sufficient evidence.

It is expedient sometimes to make this examination immediately after games; and even on the day following games where any doubt exists.

The Registration of Height, Weight, and Chest Measurement.

If too continuous, or too strenuous, a demand be made upon the vital powers of the young, his capacity for resistance necessarily becomes enfeebled. The scale and measure are the surest assistants of the educator, and in special cases should be utilised frequently. They indicate the successive condition of the boy throughout his school career, and constitute a definite guide to the medical examiner, who has learnt the physical vagaries of the young. Some grow slowly before puberty, but make up for this defect at the age of puberty, or even postpone this increase until the ages of seventeen or eighteen, when they grow enormously. Indeed, many boys who develop very gradually at first, both mentally and bodily, outstrip their school-fellows in both respects towards the end of school life, some growing in height at the expense of weight.

The circumference of the chest, measured on the bare skin at the nipple-line, expresses the capacity of the lungs on deep inspiration and expiration. This respiratory capacity has a wide range, varying from one inch to five inches. This measurement is scarcely second in value to the measure and scales, and will indicate in the young latent pulmonary disease earlier than any other physical signs. In cases where great discrepancy exists between the height and weight of a boy, the examiner must not only examine minutely, and ponder deeply, but periodically re-examine throughout the term. For failure in height, weight, or chest measurement is the surest indication that the boy is not thriving, or that incipient disease is imminent.

But in estimating the significance of these factors, it must be remembered that growth occurs by fits and starts —rapid growth requiring more rest, longer sleep, reduced work, and less severe exercise; while with loss of weight all work should be diminished or entirely cease. The use of the measure and scales is so certain a guide in the appropriate rearing of the young—revealing, as it clearly

does, and as no other method can, any existing mischief—that I offer no apology for urging the considerations I have submitted. The medical examiner will also gauge the vast influence environment possesses in modifying the health of the young.

The Rôle of the Parents.

The gist of the whole matter in the education of boys, and, even more, of girls, in the class of schools under discussion is to discover what is reasonable and right, and then for parents "to see that they get it." And to secure this the parent must bespeak the combined aid of the doctor and the educator. And the educator must listen to the doctor when he points out certain admitted propositions, which the educator has signally failed to adopt in practice. As an instance, it is well known that it is wrong, but usually unheeded, for seniors and juniors in a school to be assigned exactly the same number of hours of work and of sleep. A reasonable adjustment must be made *pro rata* with reference to age. And yet in preparatory schools where boys from 9 to 13 are educated, and in the public schools from 13 to 19, it is still the usual practice to allot the younger in each class of school the same number of hours of work and of sleep as the elder. What is really required is the following[1]:—

AS WORK AND SLEEP SHOULD BE ALLOTTED

AGE.	Hours of Work per week.	Hours of Sleep per night.
Boys between 8 and 9	15	12
" " 9 " 10	20	11½
" " 10 " 11	25	11
" " 11 " 12	30	10½
" " 12 " 14	35	10
" " 14 " 15	40	9½
" " 15 " 17	45	9
" " 17 " 19	50	8½

[1] Dukes, C. "Work and Overwork in Relation to Health in Schools." London: Rivingtons, 1893. 1s.

Even the preceding table requires rectification in individual cases. At the advent of puberty, in cold weather, and during those years when growth is most rapid; in the girl between the ages of 11 and 13, and in the boy between the ages of 13 and 16; and during the development of organs entailing severe strain upon the system, even these hours of work are sometimes excessive, and those of sleep too brief.

It must be arranged, too, that exercise, whilst compulsory, be adapted to the various ages, sizes, strength, and sex of the pupils; and varied as much as possible with some reference to the choice of the individual. For instance, some boys *cannot* play at cricket.

And even in some of these great public schools at the present time, the food is recognised by the school authorities to be insufficient, inasmuch as food is not only permitted to be supplemented by the parents, but the kind of substantial food which may be sent by the parent is actually indicated to him! Comment would involve hard words: I therefore refrain.

The Medical and Educational Advisers.

It is impossible in this limited chapter to touch upon many other matters most desirable to discuss. But there is one method, and one method only, that would remove many of the unreasonable disabilities in school life—I mean the possession by an educator of a reasonable knowledge of the elements of physiology and hygiene. The teacher in the primary schools, before entering upon his duties, has "to be taught how to teach," and is required to obtain a certificate of his competence. Further, school hygiene is a compulsory subject in all training colleges for the education of these teachers, and he has to expound the elements of hygiene to his pupils in class.

But why are these two intrinsic qualifications in an educator only imposed upon primary schools? Why should the secondary schools be omitted from these needful and compulsory requirements? It seems passing strange that the teaching profession in the secondary schools is the

only one for which any special training in the art of teaching is not deemed indispensable. Also some acquaintance with physiology in its relation to the structure and functions of the brain, as well as with the elements of hygiene, would prove of equal moment to the educator in the exercise of his profession in secondary schools. But if the teaching of hygiene in schools is to be serviceable, it must be carried into practice in the daily life at school. For, what is the physiological sense of teaching the necessity of fresh air in the maintenance of health, and in the prevention of disease, when the boy is compelled to spend many hours a day in the unsavoury atmosphere of an ill-ventilated, overcrowded school-room, or, in a still worse cubicle or dormitory? What is the hygienic use of teaching a class the virtues of personal cleanliness when its specific items are conspicuous by their absence? What is the purport, except derision, of expounding in class the significance of proportional brain work and brain rest in the physiological construction of the brain, when the hours of school work are too prolonged and the hours of sleep too curtailed for the younger members of the school? What is the physiological wisdom of instilling the need of daily exercise and recreation in the formation of character, in the development of the body and the proper performance of its functions, when work is so arranged that no time is allotted for this purpose, or is taken away for the " writing of lines," or where the games are so ill-organised that it is no one's business to see that every boy has an opportunity of playing? What is the rationality of teaching neatness and thoroughness in work, and punctuality, when the actual practice of these virtues is not enforced? What an incongruous and disastrous vision is presented if we glance at the system of school discipline as regards punishments. Could that absurdest of all punishments, " writing lines," exist for a single hour if any physiological instinct existed in the educator?

What a lack of " copy " there would be for the Press at times if the school diet question were settled by masters possessing and exercising the requisite skilled knowledge

of the physiological needs of the body, and scrupulous fairness in its execution? Masters would then also see that food preceded work, arrange for short intervals between meals, and insist upon adequate time to eat them.

What would be the sagacity of inculcating the physiological import of purity of life where boys are given meat, cheese, or beer for supper just before bed-time?

I have no hesitation in saying that, if teaching be the profession of schoolmasters, they should fit themselves for it, and wipe out the ignorance which in many cases they display in education and the care of children. And, further, let house masters be educated and interested in domestic science, and in hygiene, sanitation, and health matters generally. They need to be fully equipped for all emergencies in the management of that small world—school.

Warnings Regarding the Medical Examination of Boys.

In the medical examination of adolescents there are many pitfalls, and a note of warning is required in order that the examiner may be able to interpret the significance of the ascertained facts, so that physiological conditions naturally incidental to the age of adolescence may not be confounded with those that are pathological. In no instance is this knowledge more needed than in the interpretation of the state of the heart and circulation.

Many times have boys been sent to myself with medical certificates of heart disease, and consequent inability to engage in games, when the condition was simply the physiological one connected with puberty. An apparent hypertrophy of heart may exist, or a murmur, or very marked arterial tension, but these may all subside after a year or two, and leave the circulation normal in every respect. Where the albuminuria of adolescence is present to any extent this condition of circulation is usually found.

I am hopeful that this short chapter may serve as an incentive to the educator, and as a guide to the medical examiner in his physical examination of youth; and that such examinations may soon be extended from the primary

schools to the secondary and preparatory schools universally.

The obstacle which has to be overcome is that one which obstructs all progress, that "*omnis innovatio plus novitate perturbat quam utilitate prodest.*"

REFERENCES.

At the commencement of my work on "Health at School," 4th edition (London: Rivingtons, 1905; 10s. 6d. net), I have given a bibliography of works referred to in that volume, and I think this list will be of service to the school doctor and educationist.

The publications of "The Medical Officers of Schools Association" will also be of assistance. London: J. and A. Churchill.

The names and addresses of preparatory and public schools will be found in "the Public Schools' and Preparatory Schools' Year-book." London: Swan Sonnenschein and Co. 3s. 6d. net.

Special reference may be made to the following:—

BADLEY, J. H.: "Bedales School: Outline of its Aims and System," 1900.

BUDGETT, H. C.: "The Hygiene of Schools," 1874.

CARPENTER, A.: "School Hygiene." London: Hughes, 1887. 4s. 6d.

CARTER, B.: "Overwork in School," 1884.

CLOUSTON, T. S.: "Hygiene of Mind." London: Methuen and Co., 1906. 7s. 6d.

DUKES, C.: "Health at School" in "The Book of Health." London: Cassell and Co., 1883. 21s.

DUKES, C.: "The Preservation of Health as it is affected by Personal Habits." London: Rivingtons, 1884.

DUKES, C.: "The Essentials of School Diet." London: Rivingtons, 1899. 6s.

DUKES, C.: "The Hygiene of Youth" in Sir Clifford Allbutt's "System of Medicine," vol. i., 2nd edition. London: Macmillan and Co., 1905. 25s. each vol.

DUKES, C.: "An Address in School Hygiene on Medical Guidance in the Selection of Schools for Certain Children." London: Cassell and Co., 1889. 1s.

DUKES, C.: "An Address on Alcohol and Childhood: The Impropriety of the Use of Alcohol in Schools." London: C.E.T.S., 1890. 2d.

DUKES, C.: "Remedies for the Needless Injury to Children involved in the Present System of School Education." London: Rivingtons, 1899. 1s.

KERR, J.: "School Hygiene in its Mental, Moral, and Physical Aspects." *Journal of the Royal Statistical Society*, September, 1897.

ROBERTS, C.: "The Medical Inspection of and Physical Education in Secondary Schools." The Report of the Royal Commission on Secondary Education, vol. v. Memoranda and Answers to Questions, pp. 352-374. [Cd. 7862—iv.]. London: Wyman and Sons, Ltd., 1895. 2s. 9d.

SPENCER, H.: "On Education." London: Williams and Norgate. 6s.; cheap edition, 2s. 6d.

SPENCER, H.: "Physical Education in 1859."

V

MEDICAL EXAMINATION OF GIRLS IN SECONDARY SCHOOLS

BY

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MEDICAL inspection has come to stay in our elementary schools, but for the children of the middle and higher classes the necessity for a systematic examination as to their physical condition on entering school life, and their capacity for taking the ordinary intellectual and physical training, is by no means universally allowed. And yet education to-day is more strenuous than in the past. The curriculum is enormously increased, and though the methods of teaching may be more interesting, greater demands are made on the children's attention. Physical education is insisted on, and rightly; but the steps in this need careful graduation and adjustment to the child's powers.

More than thirty years ago Frances Mary Buss recognised the fact that before the educator could proceed with her work she should receive an assurance from a duly qualified judge that the road was clear for her. "Every girl was to have a systematic course of physical training. But there might be abnormal girls who required more or less special treatment, and reflecting on this fact there arose in Miss Buss's mind the idea that the physical education ought, as a matter of course, to be under medical inspection."[1]

[1] RIDLEY, ANNIE E.: "Life of Francis Mary Buss." London: 1895.

A lady doctor was therefore appointed to examine the girls in her two schools, North London College and Camden School. Miss Buss was a long way ahead of other educationalists in this matter, and the question of medical inspection was considered impracticable by the founders of the Girls' Public Day School Trust; nor has it ever been adopted by this body as a part of their scheme, although in individual schools it has been adopted owing to the energy and enthusiasm of the principals.

The urgent need for systematic medical examination in girls' secondary schools is coming to be generally acknowledged. At the Annual Conference of Headmistresses held last year a resolution was passed in favour of the universal adoption of medical inspection in all girls' secondary schools, with the proviso only that this inspection should be optional and not compulsory.

Dr. Acland has pointed out[1] that "it is easy to sap the foundations of physical development in the young." His words were applied mainly to the large public schools for boys; but much that he has urged applies with equal force to girls' schools. This Second Congress on School Hygiene, held in London, 1907, presented to the Board of Education a petition urging that medical inspection should apply to secondary as well as primary schools, and that endowed public schools should not be exempt from it.

Dr. Clement Dukes, at the sixth annual meeting of the North of England Education Society at Sheffield,[2] 1908, referring to this petition, said: "Every parent of any means is probably alive to the vital necessity of educating his children in the ordinary sense, but the importance of educating them in the hygienic sense is not so well appreciated by the wealthier classes, and might be brought home to them with great advantage."

Are not our case books eloquent with testimony on this point? Can we not all recall instances of lateral curvature

[1] ACLAND: "The Need for the Inspection of all Residential Secondary Schools in Matters relating to Sanitation and Hygiene." Second International Congress of School Hygiene, Vol. I., p. 334. London: Royal Sanitary Institute, 1908. 5s.

[2] DUKES, C.: *Lancet*, January 18th, 1908.

neglected until the deformity is incurable? Of deafness which a timely attention to the nasopharynx would have obviated? Of headaches due to uncorrected astigmatism? Of constipation which has become an inveterate habit and undermined the general health? And to some of us has come the girl with flagging cardiac power who is foremost in the school games, perhaps even captain of the team!

In the numerous letters which I have received from headmistresses who have experience of medical inspection in their schools, mention is repeatedly made of physical disabilities which have been quite unsuspected until the child came, in the course of the ordinary school routine, under the doctor's eye. Indeed it would be difficult to differ from Professor Osler that "it would be impossible to over-estimate the advantage of a medical department at the Board of Education which would not only direct the teaching of hygiene and physical training, but which would control medical inspection from the smallest elementary school to Eton."

The Organisation of Medical Examination.

There is, then, a considerable consensus of opinion that medical inspection is necessary in secondary schools.

It will be well to consider what steps are being taken to bring this about both abroad and at home.

In Scandinavia, the home of physical education, the school doctor has long been at work, both in the secondary and elementary public schools; and in Sweden it is said that private schools for girls come under the same rule if they wish to obtain a Government grant.[1]

In Germany the system is spreading. In the Duchy of Meiningen a staff of doctors is maintained for the visitation and medical inspection of the whole of the schools, elementary, secondary, and private. "There can be little doubt, however, that the practice of systematic medical supervision will in course of time be extended to the entire system of schools."[2]

[1] "Education in Sweden," p. 57. Stockholm, 1907.

[2] "School Doctors in Germany."

M. Klomperz writes to me from Brussels that in several of the municipalities in Belgium medical inspection is the rule both for boys' and girls' secondary public schools; but he is unable to give any information about private schools.

In the Eastern States of Europe medical inspection is advancing. In Bulgaria there appears to be a very thorough system of health supervision in the secondary as well as the lower schools.[1] Lady doctors examine in the girls' schools, and all pupils are examined on entry and twice yearly, the doctor's consulting room being part of the equipment of each school.

In Russia medical inspection is for the most part confined to the higher schools. In Japan *all* schools are medically examined, and a very large staff of doctors maintained by the State for this purpose.

In the Argentine Republic there is a system of medical inspection and of hygienic administration in all the higher schools as well as the lower, the two being under separate authorities. A staff of one chief with eight assistants and one lady doctor is maintained for the former, and the list of duties is a lengthy one. One rather wonders how the system, which reads extremely well on paper, works in practice.

In Switzerland, I am told by Herr Fritschi, there is only medical examination of girls entering a training college.

In France, Dr. Mathieu writes to me, medical inspection does not exist in secondary schools, although—as in similar institutions in England—a doctor is attached who attends the sick and makes special observations in case of an epidemic. In a few schools anthropometric details of weight and height are registered.

In Holland, I am told, there is no medical inspection in secondary schools.

In Canada a fair beginning has been made. Montreal appears to be well inspected. There are seventeen physicians, each of whom inspects all public and private

[1] WATT-SMYTH: "School Systems in Bulgaria." Second International Congress on School Hygiene, Vol. II., p. 494. London: Royal Sanitary Institute, 1908. 5s.

schools in his district. In Ontario, according to Dr. Helen MacMurchy, residential schools throughout the province have their own doctor, who examines all pupils on admission and at stated intervals.

In Tasmania, New South Wales, South Australia and Victoria, the medical inspector is at work in public schools.

Medical Examination in Girls' Secondary Schools in Great Britain.

With regard to England, I soon found when I began to gather information that there was no official source from which reliable data could be obtained. The medical department at the Board of Education has so far found the organisation of medical inspection in the elementary schools all that can at present be attempted, and whatever knowledge of the work done in secondary schools may exist at headquarters, there were no reports available giving any of the details that I required. To arrive at some definite idea of the position in English secondary schools for girls, I sent out a circular addressed to the principals of public and private schools containing the following questions:—

1. Is there any medical examination of the girls in your school?

2. Is such an examination only of special cases, or of all as a routine matter?

3. How often is each girl examined?

4. What is your own view as to the value of such examination either to the child or to the school authorities?

Rather over 600 circulars were sent out, and altogether, through these and some other inquiries, I obtained information about 276 schools, which I give below in tabular form:—

TABLE INDICATING RESULTS OF AN INQUIRY REGARDING THE PREVALENCE OF MEDICAL EXAMINATION IN GIRLS' SECONDARY SCHOOLS IN GREAT BRITAIN.

CLASS OF SCHOOL.	HAVE MEDICAL EXAMINATION.	HAVE PARTIAL EXAMINATION.	EXAMINATION BY DRILL MISTRESS.	NO EXAMINATION. PRINCIPALS FAVO'RABLE	NO EXAMINATION.	TOTAL.
Public -	85	11	16	58	57	227
Private -	6	—	3	7	16	32
Convent	1	—	—	—	16	17
	92	11	19	65	89	276

The seventeen convent schools form the harvest to 150 circulars, and it will be noted that one only of them has adopted medical examination. It will, I imagine, be safe to assume that a large majority of those who did not answer have made no arrangement for medical examination.

From the table it will be seen that in about one-fifth of the schools circularised some sort of inspection exists, and in another sixty-five the principals expressed themselves strongly in favour, although they have not yet been able to introduce it into their schools. Among those who have no inspection, many simply wrote in the negative, and expressed no opinion, for or against. Others are definitely hostile. Of those schools where the girls are examined by the drill mistress only, this proceeding is in some only accepted as an inferior substitute for proper medical inspection towards which the principal is aiming; while in others it is accepted as quite sufficient. In most a doctor is consulted before any remedial work is attempted.

In the first column of the above table are the schools which have a more or less definite system of medical inspection carried out by their own medical officer. These present a great variety of detail. In a very large number the examination is a routine one of every girl, and even when it is nominally optional, the influence of the principal is sufficient to ensure that nearly every girl avails herself

of it. Thus at Clapham High School, under the rule of Mrs. Woodhouse, the examination is optional; but not one in a hundred refuse to be examined. At the Haberdashers' School at Acton there is option; but in the first year of inspection, of 449 girls only two refused to avail themselves of it.

In other schools the examination is only at the wish of the parents, and only applies to a certain proportion (at times a very small one) of the girls. As one mistress writes, under this system it is frequently those who most need inspection who escape it, while on the other hand a few are over-examined, because of their parents' apprehension. Again, in a certain number the examination is only compulsory before admission to the gymnasium or the hockey field. In a fair number, especially in the secondary schools under the local education authorities, only those girls who appear to the teacher to be abnormal are examined by the doctor.

As to the number of times the examination is repeated, again there is much diversity. In some schools there is an entrance examination only, and this is not repeated unless some abnormality has been detected. In others the examination is repeated every year or even more frequently; in others again there is an interval of two years between each examination. In quite a large number each child is examined three times during the school career.

In practically every school having examination at all, children needing special supervision are examined as frequently as the doctor finds necessary.

The fourth question—What is your own view as to the value of such examination either to the child or to the school authorities?—elicited a large number of extremely interesting expressions of personal opinion, which will be best sifted by beginning with those hostile to the growing tendency. A most obvious observation is that these objections are urged for the most part by those who have no experience of medical inspection, and are practically all answered by those who have experience.

Dr. Schubert says: "It is extremely instructive in

reading the literature on the question to observe the strongest opposition comes from those teachers who have no school doctor in the locality, and are only expressing their fears of the unknown; and on the other hand, that the steadily increasing number of pedagogic advocates of the institution of school doctors speak from experience."[1]

The objections fall generally under one or other of the following headings:—

1. Medical inspection is unnecessary in schools for the children of well-to-do parents, who can afford to provide for their advice and treatment when required.

2. It is likely to be resented by the parents.

3. It is in danger of undermining the parents' sense of responsibility.

4. It may make girls hysterical and think too much of their bodily ailments.

It seems desirable to consider these objections briefly:

1. There would be some validity in this argument so far as the children of the upper middle classes are concerned, were it not for the results of experience where the experiment has already been made. Dr. Clement Dukes' well known figures,[2] and those available in any school where such records are kept, will show too well that physical defects are overlooked in this class too.

In one year's inspection in a school attended by well-to-do girls of the middle class, I found, in a routine examination of 449 girls, 33.7 per cent. cases of lateral curvature quite unnoticed hitherto, and all curable if taken in time; 70.7 per cent. had dental caries, and of these 61.5 per cent. were untended. In those secondary schools which are frequented by children of the lower middle class, or of gentlefolk of limited means, it is but too often that medical advice is only sought when urgent illness compels

[1] SCHUBERT: "Das Schularztwesen."

[2] DUKES, C.: "A Record of the Physical Examination of One Thousand Boys at their Entrance on Public School Life." Transactions, Second International Congress on School Hygiene, Vol. I., p. 325. London: Royal Sanitary Institute, 1908. 5s.

it. As one headmistress writes to me: "It [*i.e.*, medical inspection] is absolutely essential in girls' schools which have any serious percentage of children whose parents' income is under £300 a year."

2. The possible resentment of parents becomes more and more of a myth as we go further. A strong deterrent to the hoverer on the brink of medical inspection, it melts away and is replaced by parental approval and co-operation when once the system is in full swing.

Mrs. Woodhouse said at the London Conference for School Hygiene, 1905[1]: "As a matter of personal experience, I have found that parents appreciate the great help this medical inspection gives a headmistress in judging the possibilities of a new pupil." This view is emphasised again and again by my correspondents, and in my own work I have had ample proof of it.

3. So far from undermining the parents' sense of responsibility, medical inspection at school rightly carried out will strengthen it. In these days of small families the amount of parental experience is not large, and more often defects are neglected from ignorance than from lack of a sense of responsibility. When the importance of these, hitherto unknown, is pointed out, the mother becomes more observant. The very fact that a child is to be examined will quicken a negligent mother's care. She will not like her child to be below the standard.

4. Practically one finds that so far from becoming hysterical and thinking unduly of their health, girls acquire a sensible way of regarding themselves and their own limitations. A high standard of health is aimed at, and foolish excesses which would undermine it get to be regarded as bad form. As Dr. Kerr wrote in his report for 1906,[2] "The service in secondary schools and training colleges worked in a commonsense way will tend neither to self-consciousness nor hysteria, but will be the means

[1] WOODHOUSE: *Journal of Sanitary Institute*, vol. xxvi. London, 1905.

[2] KERR, J.: "Annual Report to Education Committee of London County Council." London: P. S. King and Son, 1906. 1s. 6d.

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of developing a knowledge of personal hygiene among the pupils, enable them to know when it is advisable to seek further medical treatment, frequently at an early stage of chronic trouble, probably prevent some illness, help to avoid the formation of bad habits, and perhaps save much futile weary study."

Of those having experience, only two wrote disparagingly of the system. From the rest the praise is unanimous. Miss Dove, of Wycombe Abbey, writes: "My view as to the value of such an examination to this school is that it simply could not be carried on in a manner worthy of the name of education without it, and to the child, that in numberless instances defects have been discovered and removed of which the parents had no cognisance, and that deformed weaklings who come to us, if they remain a reasonable time in the school, are usually turned out strong, healthy, sensible girls."

Another writes: "I should not like to be responsible for all this [*i.e.*, games, drilling, swimming] in a school of this size without medical inspection." And again: "My own view is that it is of great value to the child: (*a*) it enables the remedial measures to be taken when necessary; (*b*) it prevents her doing things which, although generally beneficial, are yet prejudicial to the healthy development of that special girl."

Miss Todhunter, head of the County School for Girls, Guildford, writes: "I am convinced that the medical examination is of the greatest help to us. It tends to create a standard of physical health for all girls."

Mrs. Woodhouse[1] writes: "Perhaps the greatest difficulty in dealing with pupils in classes is the difficulty of fixing an average standard of attainment. We all know that schemes of work may be planned for children of different ages, but we know equally well how great are the variations in mental capacity, bodily strength, and life circumstances. Hence the immense help, in the appor-

[1] Woodhouse: "Physical Education at Sheffield High School for Girls," in Vol. II. of "Special Reports on Education." [Cd. 8943.] London: Wyman and Sons Ltd., 1898. 6s. 2d.

tioning of intellectual work, of an intimate knowledge of the physical health of our pupils. How important it is that we should know that our daily demands are well within the power of, say, a rapidly growing child (whose health may be a cause for anxiety), and on the other hand, how equally important is it that with the certificate of normal health to guide us, mental indolence should not be condoned."

With regard to the examination by the drill mistress, there is, I think, a distinct danger. While certain obvious physical conditions may be noted, the knowledge which enables a doctor to diagnose the constitutional defects which may underlie these or may contra-indicate what would otherwise seem the right method of treatment, is wanting. Bodily measurements, vision, hearing, may all be noted with the help of easily-learnt rules; the presence or absence of lateral curvature, knock knees, flat feet, pigeon shaped chest, defective chest movements, all these may be determined without recourse to a doctor. But whether the child should be submitted to a course of active treatment or repose only a doctor can decide. Not long ago a young girl was brought to me because she appeared to be out of sorts. I found her suffering from well-marked Graves' disease. She had been examined by the drill mistress (a highly qualified woman from one of the foremost of our physical training colleges), who had found that she had a slight lateral curvature and poor muscular development and had put her on extra drill in addition to the ordinary gymnasium and games. In one of the communications I received from a school where examination of the girls is first carried out by the gymnastic mistress I read: "The gymnastic staff (three in number) strongly advocate compulsory medical examination upon entrance."

The Conduct of Medical Examination in Girls' Schools.

A very large proportion of the principals who have written to me express a very decided opinion that the work

of inspecting in girls' schools should be done by a woman doctor. And when due consideration is given to the natural shyness of young girls, it is fairly evident that a woman will have a better chance of carrying the work through without friction than a man. The examination, if it is to have any value, should be a thorough one, and can only be adequately carried out if the girl is stripped to her hips. This is much less of an ordeal to her if she is examined by a woman; also less reticence will be felt in answering questions about menstruation, action of the bowels, and so forth. That the examination generally is of a very thorough character I have the evidence of a good number of doctors who have kindly written to me on their methods of work, and have sent me the forms filled up at the time. It will be clear that to fill up any one of them adequately, the clothing must be removed, and also that a considerable amount of time must be given to the examination of each child. Personally I think it is impossible to complete this in less than a quarter of an hour, and I am inclined to feel somewhat sceptical as to the value of an examination completed in three minutes.

The value of the examination is, I am sure, enormously increased if the mother is present. This opinion is expressed by many of my correspondents, and I quite agree with Dr. Helen Wilson, who, speaking at the London Congress on School Hygiene, 1905, said: "The medical inspection of pupils, important as a first step, is of no practical value unless the interest and co-operation of teachers and parents can be secured. The presence of the mother at the examination should be insisted on."

It is true that the mother's presence makes the whole business a more lengthy process, but this is a small consideration if it makes it more effective for good. Advice given by word of mouth will do more than if conveyed in a written report through a third person. From the mother the doctor may learn valuable details as to previous health and family history, and may put to her questions as to the working of natural functions which it would be unadvisable to address to the child. From the mother's own

appearance and general demeanour the doctor may learn much as to the home influences and how far she may rely on these in the treatment of any defects discovered. She may tactfully suggest alterations in clothing which would be altogether resented if conveyed in a written report. She may point out the signs of insufficient sleep, improper food, undue dissipation and excitement, and urge the importance of rectifying these things.

Another important point to emphasise is, I think, that the examination should be a routine one, and not of special cases only. In the child's mind it should not be associated with the idea of physical disability, but with that of a high standard of physical health. She should go through it as a normal thing in her life, just as she goes through an intellectual examination to determine what class she shall be put into, and she should desire to acquit herself as well in the former as in the latter. It is always possible that if the examination is restricted to special cases, very important omissions may be made. Again, if a child is singled out for examination, her attention would be focussed on herself in a way that it would not be if she simply went through the ordeal in common with the rest of her class-mates. Even if anything abnormal is detected in her, it will, in the vast majority of cases, be extremely unwise to allow her to become conscious of it. Special care should be enjoined on the teachers, but the child should not know herself to be the object of it.

It is acknowledged on all sides, by the principals and by doctors, that treatment does not lie within the province of the school doctor. In no case must he trespass on the province of the family adviser. All abnormalities should be referred to the latter for treatment. It is the work of the school doctor only to advise that treatment is necessary in cases of detection of trouble hitherto not noticed. When already under treatment, great care must be taken not to disturb this in any way.

In a great number, certainly the majority of the schools, there is provision for the treatment by special gymnastic work of cases of lateral curvature, flat-foot, defective

breathing, etc., but this is carried out with the approval of the family physician, and in many instances the latter is availing himself of the opportunity for treatment of this sort of defect in the school gymnasium.

Deviations from pure symmetry of development are so frequent that they can scarcely be looked upon as abnormal. In one large school for girls of the upper class, the principal writes to me that two-thirds need remedial exercises.

The transition from the faulty position due to bad habits of standing, to the permanently twisted spine, is so gradual, and the process so much influenced by school life, that the correction of those defects is really the work of the educationalist, and in the majority of cases if this is undertaken early enough, and well done, the tendency is checked before anything that can rigidly be called deformity is reached.

There is a great deal, I think, to be said in favour of special classes for remedial work being a part of the gymnastic system in each school, and where there are a large percentage of the children of parents of very moderate means, and of scholarship pupils, it is absolutely necessary, if such cases are to have remedial treatment at all.

An interesting experiment in this direction has been made at the Central Foundation School for Girls in Spital Square, under the direction of Dr. Mary Hawkes, who has studied the working of similar arrangements in the Scandinavian schools. With the co-operation of the head mistress, and the help of one educational and two medical gymnasts, a scheme of treatment has been organised which has also been proved to be self-supporting. The girls are divided into three classes:—

(*a*) Normal, who take the ordinary drill and games;

(*b*) Weakly and undeveloped children, who have special exercises with the educational gymnast twice a week in addition to school drill. A fee of 5s. a term is charged for the course.

(*c*) Girls with special defects needing daily special drill

given by two medical gymnasts. A fee of 1s. a week is charged for this course.

The great barrier to the wider adoption of medical inspection in secondary schools is the question of expense. The public educational authorities are finding that provision for elementary schools is a strain upon their resources, and there is a very general feeling that the ratepayer ought not to be taxed to provide medical care for the children of well-to-do parents. In the case of private schools with low fees the cost of providing for it would be a heavy burden on the headmistress, and the question of competition makes it a difficult matter to make an extra charge to the parents.

In a fair number of schools, notably in those belonging to the Girls' Public Day Schools Trust, the doctor receives a fee for each inspection, this being paid by the parents. In others the doctor receives a fixed sum for the inspection of the whole school, paid by the school authorities, and in proportion to the time given. In one school at least it is a capitation fee on the number of pupils in the school. An obvious advantage of this arrangement is that the question of fee will not interfere with the more frequent examination of any child when found necessary.

At a meeting of medical inspectors in the secondary schools for girls in and near London, in June last, a strong feeling was expressed that payment for their work should come from the school authorities and not from individual parents. This means the official recognition of the system, parents understand that the examination is part of the school routine, and a great deal of friction and waste of time is avoided which is inevitable when parents have to be persuaded to pay a fee for an examination which does not appear to them to be essential.

General Conclusions.

From this short review it will be seen that a good deal is already being done in secondary schools for girls in England, and that the system is growing from a healthy stimulus within and not from any regulations imposed

from without. I venture to think that, though we may be behind some countries which have a more uniform system at work, we are more likely to arrive at a method suitable for us in this tentative and experimental way than by the enforcement of hard and fast rules by hasty legislation. But on looking through the work done, it does seem that a very large amount of valuable material for increasing our knowledge of normal physical conditions in the growing child is being practically lost, and that it is highly desirable that there should be some central authority charged with the work of co-ordinating the result of researches which at present are buried in the record of wholly disconnected schools, and to direct in some degree the labours of individual workers, more especially when there is a question of collecting information on any particular point. But such an authority would have to leave the greatest possible freedom to individual principals and doctors in carrying out the work in the way in which individual experience has taught that it could best be done under their local conditions.

I herewith tender most grateful thanks to the numerous correspondents, both principals and doctors, who have answered my inquiries and given me the fruit of their experience.

REFERENCES.

In addition to the references given in the body of the preceding chapter the following will be of service:—

BERGER: "Die Schularztfrage für höhere Lehranstalten." Hamburg and Leipzig: Leopold Voss, 1904.

COLMAN AND FLEMMING: "Medical Inspection in Secondary Girls' Schools." *The Teachers' Guild Quarterly*, October 15th, 1908.

DUKES, CLEMENT: "Health at School considered in its Mental, Moral, and Physical Aspects." 4th edition. London: Rivingtons, 1905. 10s. 6d. net.

FORSYTH, DAVID: "Children in Health and Disease." London: Murray, 1909. 10s. 6d. net.

GUTHRIE, LEONARD: "Functional Nervous Disorders in Childhood." London: Henry Frowde and Hodder and Stoughton, 1907. 7s. 6d. net.

HOGARTH, A. H.: "Medical Inspection of Schools." London: Henry Frowde and Hodder and Stoughton, 1909. 6s.

KERR, J.: Annual Reports to the School Board for London, 1902-1904. London: P. S. King and Son. 1s. 6d.

KERR, J.: Annual Reports to the Education Committee of the London County Council, 1902-1909. London: P. S. King and Son. 1s. 6d.

MATHIEU, ALBERT: "Neuræsthenie et Dyspepsie chez les jeunes gens." *International Archives of School Hygiene*, vol. i. Leipzig: Wilhelm Engelmann, 1905.

MCMURCHY, HELEN: "Medical Inspection of School Children." Paper read at the meeting of the British Medical Association at Toronto. *British Medical Journal.* 1906.

RIDLEY, ANNIE E.: "Frances Mary Buss and her work for Education." London: Longmans, 1895. 7s. 6d.

SAMOSCH: "Ueber die Nothwendigkeit der Anstellung von Schularzten der höheren Schulen." Hamburg and Leipzig: Leopold Voss, 1904.

SIRIDY, ARMAND: "La Puberté et l'Education des jeunes filles." *International Archives of School Hygiene*, vol. iv. Leipzig: Wilhelm Engelmann, 1908.

WOODHOUSE: "Physical Education at the Sheffield High School for Girls." Special Reports on Education, vol. ii. [Cd. 8943.] London: Wyman and Sons, 1898. 6s. 2d.

See also:—

Board of Education Pamphlet, No. 4: "School Doctors in Germany," by W. H. Dawson. London: Wyman and Sons, 1906. 6d.

"Proceedings of the Conference on School Hygiene, 1904-5." *Journal of the Royal Sanitary Institute*, vols. xxv. and xxvi.

"Transactions of the Second International Congress on School Hygiene, London, 1907," vols. i., ii., and iii. London: Royal Sanitary Institute, 1908. 5s. each; 12s. 6d. the three vols.

VI

MEDICAL EXAMINATION OF CHILDREN UNDER THE POOR LAW AND IN ORPHANAGES AND INDUSTRIAL SCHOOLS

BY

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BY the Act of 1907 provision is made for the medical inspection of the children in all the elementary schools of England and Wales. But there is a number of children of the poorer classes—usually of the poverty-stricken classes—who are not being educated in the elementary schools, and the percentage of these children who need medical attention is high. There are among them a comparatively large number who are weak and ailing, who are afflicted with eye, ear, and throat ailments, and who therefore need medical care in their upbringing, and medical treatment for their defects—indeed, adequate treatment is imperative if they are to grow up into citizens of value to the nation. And medical examination and treatment which are so necessary for the children of the elementary schools are even more urgently called for in the case of these children who are wandering in the by-ways of elementary education. Some of these children are in orphanage schools, some of them are in Poor Law institutions, and some of them are in reformatory and industrial schools. A brief consideration of these classes, especially of the first two, will lead

inevitably to the conclusion that this type of child may well be in greater need of medical attention than the average elementary school child. And if among these children there is a large proportion of waifs and strays, orphans whose early years were passed in such neglect and semi-starvation that impaired health was likely to result therefrom, it is right that the questions should be asked: "Are these children medically inspected?" "Do their ailments and defects receive proper attention?" And, "Are the children given the best chance of overcoming the evil effects of their early environment and upbringing?"

Children of the Poor Law.

On January 1st, 1909, there were 253,775 children who were in receipt of relief, exclusive of the number of children who were relieved as insane or casual paupers. Of this number 66,602 received indoor relief either in the workhouses or workhouse infirmaries, or other institutions to which Poor Law children may be sent; and 187,183 were in receipt of outdoor relief. Of the 66,000 children receiving indoor relief, seven-elevenths, or 42,000, were of the school age (3 to 14), and taking the proportion as applicable to the children in receipt of outdoor relief, there are nearly 120,000 such children of school age.

Outdoor Relief Children.

The children in this class are in the care of parents or guardians whose means are insufficient for their full support; the outdoor relief which they obtain is not necessarily continuous, for the need of it may be determined by the ill-health and consequent incapacity for work of their parents and guardians, or by their failure to obtain work. These children attend the elementary schools and are therefore medically inspected, and if they are in need of medical treatment the parent is notified of that fact and advised to consult the "medical attendant." The parent or guardian may be very anxious that the child should be given the best chances of good health, and he may consult the Poor Law district medical officer. In 60 per cent. of

the cases the ailment is one of the following group of conditions: Eye disease and defective vision, ear, throat, and nose disease, and carious teeth. Now, the great majority of district medical officers do not test for vision. They are usually very busy practitioners, and they are unable to give sufficient time for the full and proper treatment of diseases of the ear, throat, and nose; and in the matter of dentistry their treatment resolves itself into the measure of extraction. If the local education authority have provided a school clinic, or have contributed to the voluntary hospitals in return for treatment provided the ailing child is attended to therein; or treatment may be obtained at the voluntary hospital in the absence of a contribution from the local authority. But the education authorities which have provided treatment are not numerous, and the stress on the voluntary hospitals is already too great in many areas, so that the child in receipt of outdoor relief does not, in the great majority of cases, receive the medical treatment and attention which it so urgently requires. This class of child is very much in need of attention. Every person who has studied the incidence of pauperism will know that before a man obtains relief there is usually a period during which the means of sustenance are scanty and the food provided for the home is insufficient. This period may last for many months, and its duration varies with the reluctance of the bread-winner to seek pauper relief; and for the children this period is one of semi-starvation. They attend the elementary schools in their half-fed condition; free meals are provided by only a few education authorities in the country, and their education under these conditions is a farce. Moreover, the bad times through which they pass are frequently the determining factor in the incidence of an ailment or disease. With such a previous history, it is evident that these children are in need of attention. The defects found by the school medical inspector require treatment, and it has been shown that in the majority of cases the treatment is not obtained. There are many possible ways of solving this difficulty. In the future it is

probable that the proposals of the Minority Report of the Poor Law Commission will be adopted in a modified form, but for the present the facts given above should be sufficient argument for the provision of medical treatment either by the board of guardians or by the local education authority. If the latter provide treatment to any great extent for the ailing elementary school child, it would appear to be more reasonable that the outdoor relief children should be classed for treatment by the education authority with the non-pauper child, and the cost recovered from the board of guardians in the same way as the cost, or part of the cost, of treatment may be recovered from the parents of the non-pauper child. It would be the more reasonable course, and more easily worked from the administration point of view. And I believe it would result in more efficient treatment, for the proper treatment of these diseases requires a special knowledge of the ailments and special skill in performing the necessary operations; and the local education authority which provided that special knowledge and skill for a large number of ordinary elementary school children would be in a better position to extend their advantages to the outdoor relief children than the board of guardians would be to provide such knowledge and skill specially for the children under their charge. If any reader doubt the need for such special knowledge and skill, two instances may be mentioned:—vision testing and the operation for adenoids. For the former, not every medical man has the special knowledge and practice; and in the operation for adenoids a far greater amount of skill and experience is needed for a successful result than was formerly accepted. Many of the relapses and unsuccessful results are really due to the fact that the operation has been both incomplete and indifferently performed, and not to the lack of after-treatment.

There are also over 8,000 poor law children who are boarded-out in families, a method of dealing with the child which is excellent, provided that adequate supervision is exercised over the "families." These children attend

the elementary schools, but if any are discovered by the school medical inspector to require medical attention the difficulties of obtaining it, described above, are always present.

Children in Poor Law Institutions.

In 1896 a committee appointed by the Local Government Board recommended that every child over three years of age should be removed from the workhouses. The environment of such institutions is quite unsuited to the development—mental, moral and physical—of children, but of the 66,000 children in receipt of indoor relief in 1909 there were still over 23,000 maintained in the workhouse and workhouse infirmaries. Of the remaining number there were over 11,000 in district or separate schools, and over 19,000 in cottage and other homes. Of the 66,000 children there were over 42,000 who were of school age, and the schools which these children attended are given in the following table:—

CLASS OF SCHOOL.	BOYS.	GIRLS.	TOTAL.
Public elementary schools ...	11,539	9,473	21,012
Poor law schools:—			
District schools	2,049	1,609	3,658
Separate schools	6,016	4,813	10,829
Workhouse schools ...	310	341	651
Institutions (other than imbecile asylums and remand homes) belonging to the managers of the Metropolitan Asylum District ...	1,147	636	1,783
Total	21,061	16,872	37,933

The 21,000 children educated in the elementary schools are medically inspected, and if medical treatment is required it is carried out, either by the medical officer attending the institution in which the children live—workhouse, cottage

homes, etc.—or the children attend as out-patients at the voluntary hospital.

The District and Separate Schools.

The opinions expressed concerning these schools have been conflicting. The Mundella Report of 1897 condemned them, not only as being a serious handicap to the mental and moral development of the children, but also as being the means of spreading infectious disease; whilst in the Report to the President of the Local Government Board in 1908, Dr. Macnamara has reserved judgment. The basis of Dr. Macnamara's Report is shown in the following quotation taken from the Report in question: "I was able during July to visit two of these district schools. In one of them, the North Surrey School at Anerley, I spent some hours, and was quite satisfied with everything I saw. . . . My visit to the other school was very brief, and during the summer vacation. I could not, therefore, fairly form any judgment of the work it is doing." He also sent a letter of inquiry to the superintendents of a number of typical district schools, and obtained replies which indicated that these schools were excellent institutions, judged both from the hygienic point of view and from that of the mental and moral development of the child. It is evident that his personal visits to two institutions were inadequate for the purposes of information; and the replies of the superintendents of these schools, although they may have been honest beliefs, cannot be regarded as the expression of unbiassed opinions. I believe that in most of these schools the children are cared for and educated as well as they can be *under the circumstances*, and there are schools, such as the North Surrey district school, in which the good influence of the master and mistress is lasting, and is of the utmost value in the development of the child on right lines. But the system is a bad one, and however much these institutions are improved, and however well managed, they will never be fit places for children. To herd together hundreds of

children in a barrack school, where they can receive but little individual attention, and where they are apt to become mere "numbers," is to diminish the chance of turning them into healthy, useful citizens. The absence of home life, of the personal kindness and consideration which would be the saving of these children, and the increased risk of damage from infectious disease, complete a combination of conditions which should lead to the total abolition of such schools. There is no doubt that the medical attention provided in the case of acute illness in these schools is efficient; moreover, increasing attention is being given to the care and preservation of the children's teeth, a matter in which Poor Law authorities in general have shown a greater amount of forethought and wisdom than they are credited with in other medical matters. But there is urgent need in most of these schools for a more thorough and frequent medical inspection, and a fuller treatment of the ailments and defects which inevitably will be discovered thereby.

Before leaving this subject, mention may be made of the class of Poor Law child which on account of various administrative difficulties has not obtained the treatment suitable for its proper growth. This class is made up of children who are weak and ailing, who are neither in a fit state of health to be classed for treatment with the normal child and sent to the scattered homes or emigrated to Canada, nor ill enough to require the constant medical attention needed for the acutely ill.

Under the present system these children are too often allowed to grow in the surroundings of the workhouse infirmary, and the effect of this environment on the child is necessarily evil. The monotony of life in the ward, the lack of freedom and fresh air, and the unnatural seclusion from the world beyond the grey surrounding walls would hinder the development of any child, and the effect is even more serious in the case of a child who is weak and ailing. And the disadvantageous circumstances of their upbringing can have but one result: the majority of these children grow up in the workhouse environment into weakly adults

with a store of health insufficient to enable them to earn their living, and they therefore remain on the rates during the rest of their lives, and the cost to the State is not negligible. The rational upbringing of these children in open-air schools would result in a far higher proportion of normal adults, healthy and well equipped in education so that they would be valuable wage-earning citizens.

Orphanage and Reformatory Schools.

Scattered over England there are many institutions for the education and upbringing of poor children. The following list is taken from the tables published by the Reformatory and Refuge Union[1]:—

English certified reformatories	37
Certified industrial schools	119
Certified day industrial schools	15
Voluntary homes	458
Homes for working boys	19
Magdalen institutions	322

During the latter part of 1909, acting in conjunction with the National League for Physical Education, I drew up a form of inquiry which was sent to the superintendents of ninety-five of these homes in which there were over forty children, the inquiries relating mainly to the question of medical inspection and the treatment of defects and ailments found thereby. Of the forty-five replies received, ten referred to institutions for blind or deaf children, and two related to training ships; and of the remaining thirty-three institutions there were ten in which the children were educated at the elementary schools, and were therefore at least medically inspected, even if their defects did not receive treatment. In the replies concerning the remaining twenty-three institutions, representing over 4,000 children, it was stated in all cases that medical attention was obtained usually from the visiting medical officer whenever a child fell ill. In thirteen of these institutions there is a medical

[1] The Reformatory and Refuge Union, Victoria House, 117, Victoria Street, London, S.W.

examination on the admission of the child, but in only a few cases is this entrance examination directed specially to the investigation of eye, ear, throat, and nose disease. Fifteen out of the twenty-three institutions were definitely stated to have no system of medical inspection, and of the remaining eight the replies were unsatisfactory in all but four cases. A marked feature of the replies was the emphasis laid on the fact that medical attention was always obtained when the child fell ill; adenoids were operated upon when they happened to be noticed. Now, the same thing was said of the elementary school children before the advent of medical inspection. If a child fell ill, it usually received attention, and there were few people who had not given special attention to the matter who considered that medical attention was required for the more chronic ailments which were continually handicapping the child in its proper growth and development. The routine medical inspection in elementary schools has revealed a proportion of handicapping conditions in the children which is astonishing, and I am of opinion that in all these other institutions there should be compulsory medical inspection of the children. The twenty-three institutions mentioned above contained over 4,000 children; I believe they are typical of the very much larger number of such institutions in England and Wales, and I estimate the children affected as at least 50,000.

In the reformatory schools also a fuller medical inspection is needed. In these institutions a medical attendant is always at hand if a child falls ill, but sufficient attention is not paid to the conditions which are damaging the child's health. The nation has done well in giving thought to the children in the elementary schools, but it cannot afford to forget the children in the by-ways of elementary education. For economic reasons, every child should be given the best chance of growing up into a healthy and vigorous citizen, strong to carry on the traditions of a country such as ours. And from any consideration of this question the appeal of humanity cannot be eliminated, nor would it be desirable that it should be eliminated.

REFERENCES.

It is very difficult to obtain reports, articles, or indeed any reliable data dealing with the subjects which this chapter has endeavoured to explain, but the following may be of some service for reference:—

ALDEN, M.: "Child Life and Labour." 2nd edition. London: Headley Bros., 1909. 1s.

EDWARDS, A. D.: "Children of the Poor." London: Hammond and Co., 1909. 1s.

GORST, J. E.: "The Children of the Nation." London: Methuen and Co., 1906. 7s. 6d.

LEIGH, BLANCHE: "The Boarding-out of Poor Law Children." London.

MADDISON: Classified List of Child-saving Institutions. 19th edition. London: Reformatory and Refuge Union, Victoria House, 117, Victoria Street, Westminster, S.W., 1909. 2s. 6d.

MCVAIL, J. C.: "Medical Treatment of the Poor." *British Medical Journal*, February 26th, 1910. 6d.

BROWNE, A. YORK: "Reformatory School Commitments." London: Reformatory and Refuge Union. 1902. 2d.

The following official works and Reports should be consulted:—

Reports of the Local Government Board, 1908-9. Part I. [Cd. 4786.] London: Wyman & Sons, 1909. 1s. 4d.

Reports of the State Children's Association. London: 53, Victoria Street, S.W.

Annual Charities Register and Digest. 19th Ed. London: Charity Organisation Society, Denison House, Vauxhall Bridge Road, S.W., 1910. 5s.

Report on Medical Inspection in Orphanages, Institutions for the Blind, Deaf, and Dumb, etc. Leaflet No 5 of the National League for Physical Education and Improvement. London: 4, Tavistock Square, 1910. 1d.

Report and Evidence of the Royal Commission to inquire into the Poor Law. London: Wyman & Sons, 1909.

"Law relating to Child-saving and Reformatory Efforts." 4th Ed. London: Reformatory and Refuge Union, 1909. 2s. 6d.

VII

MEDICAL EXAMINATION OF SCHOOLS AND SCHOLARS IN THE BRITISH ARMY

BY

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ARMY schools are maintained at the expense of the State for the gratuitous instruction of all children of soldiers of the Army, or First Class Reserve called out for permanent service. Also for the children of army schoolmistresses who for this purpose are reckoned as soldiers. In addition for children of soldiers who have died in the service, and those of numerous other classes of men, *e.g.*, barrack wardens, pensioners, or discharged soldiers in regimental or garrison employment, warders of military prisons, etc. Under special sanction from the general or other officer commanding, the children of pensioners or discharged soldiers not in garrison employment, of canteen keepers, contractors, and labourers, etc., may also be admitted gratuitously, and eventually any child, practically, may be allowed to attend under special sanction on payment of from one to five shillings per mensem, according to the strength of the claim the child possesses, through its parents' position, to such privilege.

Schools are classed as Garrison or Detachment Schools, the former under army schoolmasters or schoolmistresses, and the latter under acting masters or mistresses, and are

divided into elder children's schools (mixed or boys only), elder girls' schools, and infants' schools. The two last-named under schoolmistresses; those for elder children under schoolmasters.

Officers commanding are responsible that the children of all warrant officers, non-commissioned officers, and men married with leave attend the school from the age of 5 to that of 14, or until Standard VII. has been passed. They have, however, no responsibility as regards the children of the other classes, above detailed, who are entitled or permitted to attend army schools. If the army school is in the opinion of the responsible medical officer at too great a distance from the residence of a child, then it may be permitted to attend an "efficient" civil school; also if a child has passed Standard V., and its parents are anxious for it to obtain an improved secondary education, a similar indulgence may be granted, but without expense to the State. Otherwise the child must attend at the garrison school wherever such exists.

The ordinary daily length of instruction is five hours as a maximum, or $23\frac{3}{4}$ hours a week as a minimum. Saturday is not usually reckoned as a school day unless it is necessary to make up the time spent in school to that figure. Children under 5, if permitted to attend, are only allowed to do so for two to three hours in the morning. The hours of attendance vary with the time of year, and abroad, naturally, with the exigencies of the climate.

Up till comparatively recently the medical supervision of children in army schools was of a purely general description. The medical officer in charge of effective troops in any garrison was enjoined by regulations to visit the school "frequently" at such times as the children were present, to see that the studies produced no injurious effects, and also for the purpose of ascertaining that the ventilation, warming, lighting, and sanitation of the school generally was properly attended to. The expression "frequently" left the number and regularity of these inspections very much to the discretion of individual medical officers, but it may be taken that as a rule the visit

was made once a week, at the same time as the periodical weekly inspection of barracks. It was rarely the case, however, that any general study of the development of the children was made, the inspection, apart from its purely sanitary aspect, being limited to an inquiry after the general health of the children, particularly with respect to ophthalmia, or other contagious disease. Special children who were known to have been lately under medical care were, as a rule, called up to be looked at, but since in large garrisons the children came for medical attendance under the care and notice of the medical officer of the Families Hospital, and not under that of the medical officer in charge of the unit to which their fathers belonged, it was often impossible, except by direct inquiry from the schoolmaster or schoolmistress, to know what children had lately been ill. It may be stated in brief that the inspection as conducted in those days was directed entirely to the early detection of any possible case of infectious disease, and especially of conjunctivitis. Individual officers undoubtedly paid attention, in some cases very close attention, to the lighting of the school, the adaptability of the desks to the various ages, and so on, but the majority undoubtedly confined their inspection of the children to the points above noted, and to the general sanitation of the building. It may be accepted, however as fairly certain that prior to the passage of the Education (Administrative Provisions) Act of 1907 army schools were much more closely and efficiently supervised, in a medical sense, than council or national schools.

In consequence of the passing of the Education (Administrative Provisions) Act of 1907 it was decided by the Army Council in April of the year following to apply to army schools, both at home and abroad, the same system of physical examination that was laid down in that Act for civilian schools with certain necessary modifications, imposed by the different conditions under which the children of the soldier live. The first medical examination under these rules was carried out between the Easter and summer holidays of 1908, and for future

guidance it was laid down that subsequent examinations should be made (1) at the time of, or shortly after, the first admission of the child at school; (2) at the second, or about the third year of school life (say seventh year of age); (3) at the sixth year of school life (say, tenth year of age); and (4) lastly, shortly before the termination of school life. A special form (Army Form C. 319) was issued detailing the various points to which attention should be directed. These comprise a statement of previous illnesses, if any, and a note of any peculiarity in the family history. As regards fathers, of course the information available for this part of the report is more trustworthy and fuller than that at the disposal of inspectors of civilian schools.

These inspections are carried out by the medical officers in charge of the units to which the fathers of the children belong, or else by the medical officer specially detailed for the duty. It would be too soon to speak definitely as to the effect of these inspections, but it cannot be otherwise than good. At the same time, as already stated, the soldier's child was even prior to the Act of 1907 considerably more under direct medical supervision than the civilian's child of the same social class.

REFERENCES.

The rules for the conduct of Army Schools are contained in "Army School Regulations, 1906." These are liable to amendment from time to time. The instructions as to examination were promulgated in a "War Office letter" dated April 11th, 1908, with which the "Army Form" referred to above was circulated.

VIII

THE GENERAL ROUTINE MEDICAL EXAMINATION OF SCHOOL CHILDREN

BY

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IN framing a scheme for the routine medical examination of school children it is well to have clearly in mind the object which it is hoped such an investigation will attain. This object I take to be clearly this—the removal, as far as possible, of all conditions which act as obstructions to mental and physical growth—in a word, the smoothing of the path of educational progress. Subsidiary to this, but yet needful at this stage, is the collection of certain details and measurements from which useful generalisations can be made. The purpose, then, which the school doctor must set before his mind is the detection at the earliest possible stage of all deleterious influences at work in the school, and of all departures from the road of mental and physical health in the scholar. The first requires keen observation of the hygienic conditions (ventilation, light, heating, etc.) as also the educational arrangements (seating, length and arrangement of tasks, etc.) of the school he is visiting, with a special eye to the comparison of class with class and school with school. The second, into which alone we can enter here, demands the acumen of the skilled clinician. It is in the infants' department that the beginnings of disease, disease in a curable stage, are apt

to manifest themselves, and it is here, therefore, that medical inspection finds its most useful sphere of action.

General Considerations regarding Procedure.

In the examination of young children it is of the utmost importance that their confidence be gained at the outset. Failing this the examination becomes a useless and heart-rending struggle. To avoid this I find it best to begin with an older and reliable child, and to let the others (or at any rate those next to be examined) see clearly what is going on. Nothing is so terrifying to children as a hidden examination, especially if, as must occasionally happen, the cries of a "conscientious objector" come from behind the screen. A crying child will set a whole roomful in tears and spoil a whole morning's work; for this reason it is well to begin with the most stolid and leave nervous children to the end. A cheerful easy demeanour will help to give confidence, and the avoidance of unfamiliar implements is important. In throat examination, for instance, it is good to use, in place of a spatula, an uncut cedar-wood pencil of which the school will readily supply a packet. These, after use, are placed in antiseptic solution and at the end of the sitting are dried and handed back unspoilt. The pencil should first be used to inspect the teeth on either side, and by the time this is done all the child's apprehension has vanished and the tongue may be depressed without resistance. The onlookers watch the proceeding without terror.

The following scheme aims at brevity, and has been framed to include only such points as are of practical utility. Even here, however, it may happen that the time allotted to inspection is too short for their inclusion, and on this account such as may be considered "non-essentials" are marked with an asterisk. With such a scheme as this it will be possible, with some help from school teacher and nurse, to examine some ten children per hour. If more time is available for the school doctor other points of value may be added to the scheme. It is obvious that school

inspection will be just so much as the opportunities in time and apparatus at the disposal of the school doctor allow. These are at present small, and the following scheme makes no reference to investigations for which special apparatus is needed, since such investigations are, at present, mostly outside the scope of school inspection. At the same time, in the following model the requirements of the Board of Education Schedule of 1908 are satisfied sufficiently closely for practical purposes.

A Practical Scheme.

Name.

Address.

Age and Standard.

*Family Conditions
- Number of Family.
- Number of Rooms.
- Number in Sleeping Room.

Infectious Diseases
- Measles.
- Scarlet Fever.
- Other Diseases.

Complaint of Mother or Teacher.

Clothing.

Nutrition
- Excellent.
- Good.
- Average.
- Poor.
- Bad.

Colour
- Excellent.
- Good.
- Average.
- Poor.
- Bad.

Skin.

Heart.

Lungs.

- Teeth
  - Temporary
    - Need for—
    - Toothbrush.
    - Extractions.
  - Permanent
    - Need for—
    - Toothbrush.
    - Fillings.
    - Extractions.
- Throat and Nose
  - Tonsils.
  - Adenoids.
  - Chronic Nasal Discharge.
- Neck Glands.
- Ears
  - Hearing.
  - Discharge.
- Vision and Eye Diseases.
- Nervous System.
- Mental Condition.
- *Weight (without shoes).
- *Height (without shoes).
- Other defects noticed.
- Remarks.
- Recommendations.

Clinical Characteristics.

It will be convenient to deal shortly with each of the above headings and to point out what conditions should be looked for and what most frequently present themselves among school children.

Complaint. It is always an advantage to hear what mother and mistress have to say about a child so that attention may be directed into the right channel of inquiry. Such remarks as "suffers from headaches," "always getting colds," "can't learn anything," and the like, reveal conditions which might otherwise be overlooked in the few minutes at disposal.

Clothing. The clothes give a good index to the social position and personal attributes of the parents and should be noted.

Nutrition and Colour. The child being stripped to the waist, without which no examination worth recording can be made, the general nutrition and the colour of the face should be noted. These are best recorded separately, though in practice malnutrition and pallor often go together and are twin signs of unhygienic living, the result of poverty or neglect. Pallor must not be recorded as "anæmia," from which it is quite distinct. This will be realised if the comparative redness of lips and mucous membranes be noted, and similar confirmation is obtained with the hæmoglobinometer. If anæmia is suspected this should be recorded separately.

Skin. The skin should be rapidly inspected with a view to cleanliness, bites, or eruptions, of which scabies, impetigo, and tinea corporis should be specially borne in mind. The head must also be examined for tinea and nits.

Cardiac Conditions.

It is best at an early stage to examine the chest, or a note may first be made as to mouth-breathing, nasal discharge, and the condition of the neck glands. On no account, however, must the mouth or throat be examined before the chest in case active objection is taken to this procedure. The heart is easy to examine in children of 6 years and upwards owing to the thinness of the chest walls and the relatively small volume of the lungs. In children below this age it is less easy on account of the smallness of the parts and the layer of fat about the chest wall. In young children the apex beat is near the nipple line and relatively high up, in older children the apex is normally one-quarter to one-half inch within the nipple line. A point which is not sufficiently appreciated is the ease and accuracy with which the outline of the heart (the deep dulness) may be mapped out in children, where in adults the voluminous lungs make this proceeding difficult. For this purpose percussion should be light, but carried well through, and reliance should be placed on tactile as well as auditory sensation. The pleximeter finger should be placed

parallel to the heart's borders and carried backwards and forwards till the margin is assured. By this method I find the deep dulness in children extends from one-and-a-half to one-and-three-quarter inches to the right of the mid-sternum to a line one-quarter to one-half inch inside the left nipple line. Anything outside this should be regarded as abnormal.

The heart conditions which come most prominently before the school doctor are (1) cardiac strain and (2) rheumatic heart disease.

Cardiac Strain. Owing to careless percussion and neglect to make out the heart's area, cardiac enlargement in children is frequently overlooked. Nevertheless enlargement of slighter grade is exceedingly common in elementary schools, and even considerable enlargement occurs in a proportion. Among 181 boys examined by myself with a special view to this point, 7 per cent. showed enlargement of such grade that there was an increase of one to one-and-a-half inch in the transverse measurement. It is significant that most of these cases occurred in "boy scouts." The lesser grades of enlargement are apt to be ascribed to "growth of the heart" and "hearts of infantile type," but that the true explanation is "strain" is shown by the study of boys' hearts before and after prolonged exertion. Enlargement in the transverse measurement occurs, and is generally of long-lasting character. It is probable that cases of cardiac hypertrophy discovered in boys are the outcome of such cases and represent an attempt on the part of the heart to recover its lost reserve power. Cardiac strain in childhood results from the abuse of natural conditions of play and is very apt to be produced by such prolonged exertion as attends boy scouting, holiday excursions, and military manœuvres.

Rheumatic Heart Disease. Nothing less than routine inspection of children will discover cases of valvular disease in the schools. These children cannot be picked out at sight by a medical inspector, however skilful, and the cases of "heart disease" furnished by school teachers generally resolve themselves into stomach pains. Routine inspec-

tion, however, discovers a number of cases of valvular disease, generally mitral regurgitation but occasionally also disease of the aortic valve. Such lesions are generally recognised without difficulty and their relative importance should be carefully assessed. I am accustomed, apart from other recommendations, to advise the mothers of all such cases attending school that they should spend a Saturday and Sunday in bed once a month. This measure greatly lessens the risk of loss of compensation. At the same time, both parent and teacher should be warned that sore throat or pain about the body in these children must be regarded as a fresh rheumatic attack requiring treatment.

While speaking of rheumatic valvular disease it is necessary to refer to a rheumatic heart lesion of equal importance but much more apt to be overlooked. I refer to *rheumatic myocarditis* showing itself by a cardiac dilatation accompanied after a time by a compensatory hypertrophy. These cases are more likely to be misinterpreted than are cases of valvular defect.

Accidental Heart Murmurs. An important matter for the school doctor is the recognition of "accidental" heart murmurs in healthy boys and girls. These are of quite common occurrence, and not infrequently give rise to error in diagnosis.

Apical murmurs are generally cardio-pulmonary in origin, and best heard just outside the apex beat. They generally have a "puffing" quality distinguishable from murmurs of fluid origin, and are brought out by cardiac excitement of any causation. They may persist for years, and in such cases are, perhaps, due to unsuspected pleural adhesions. When hypertrophy, the result of former strain, is accompanied by such a murmur a diagnosis of mitral disease is exceedingly likely to be made. This error is best avoided by noting the puffing quality of the murmur and the fact that it disappears or is greatly lessened when the breath is held, and is accentuated (often with a cogwheel character) during inspiration. It is important to recognise that these murmurs may be of musical quality. The common murmur is systolic in time, but,

on rare occasions, a soft diastolic murmur of similar explanation is encountered.

Re-duplication of the first sound of the heart is common in health and always occurs after deep breathing.

Basal murmurs.—These are quite common in the healthy, especially the murmur which occurs over the third costal cartilage or third space to the left of the sternum, and is commonly called "hæmic." This murmur can be produced by forced expiration in a majority of the healthy, and is not uncommonly present during quiet breathing.

Pulmonary and Intra-Thoracic Affections.

Lungs. The lungs in children offer many pitfalls in diagnosis to the unwary. Error usually arises from a tendency to ascribe signs discovered in a single lung to tuberculous disease. As a matter of fact, one-sided lesions are often of other causation, and are very commonly temporary in character. Thus collapse of an area of lung is quite common, and bronchitic signs may for a time be audible on one side only. A word will be said about the most important lung conditions to be considered at school age.

Tuberculous Thoracic Glands.—These are probably present in some 20 per cent. of school children and lead to pallor, malnutrition, and asthenia. Their diagnosis is seldom more than a suspicion, and rests mainly on a condition of ill-health unexplained by other causes. The absence of other factors must not be made too much of, however, since it is upon the ill-fed and neglected that the disease is so readily grafted. Physical signs are generally uncertain or absent, and this is not wonderful since the enlarged glands themselves are quite out of reach. Pressure signs are rarely found in children attending school, and such occurrence as visible chest veins, areas of pulmonary collapse, or the presence of bronchial catarrh, though often associated with these cases, are all open to other interpretation. When disease has spread into the lung at its root the child is unlikely to be found for long in the school.

Phthisis, or pulmonary tuberculosis of the type met with in adults, is an uncommon disease in school children, though its incidence increases with age. In British schools about .5 per cent. of cases have been demonstrated, and careful post-mortem work gives somewhat similar results. Other forms of lung tuberculosis, such as the fatal forms in young children of the disease spreading from caseous thoracic glands, must not be confounded with primary apical disease, which runs a different course. Among 1,196 cases of phthisis treated by myself consecutively at my "Chest" Hospital, only 2.6 per cent. were below the age of 15 years; the Registrar-General's reports give similar testimony to the comparative rarity of phthisis at school age. The disease from the point of view of diagnosis presents features very similar to that in adults. Children may appear in good health with marked or even advanced signs; on the other hand, cases of arrested disease are not uncommonly discovered, and the tendency to cure is a striking feature.

Bronchitis. This will naturally be found in a large number of children under routine examination, and it is not uncommon to find a bronchial catarrh quite unaccompanied by symptoms. Bronchial catarrh appears to be common in children with tuberculous thoracic glands, due, perhaps, to deficiency of gland function, but it must not be thought that such catarrh is tuberculous, or in itself justifies a diagnosis of tuberculous disease.

Bronchiectasis and Fibrosis. This condition is not uncommon in children, and is often met in the schools. The disease is generally basal or involves a whole lung, and commonly originates in whooping-cough in early life, or broncho-pneumonia complicating whooping-cough or measles. It may, more rarely, be apical, and date from an unresolved lobar-pneumonia, and in this case may simulate phthisis very closely. Bronchiectasis is very commonly mistaken for tuberculosis, and many children have been unnecessarily excluded from school on this account. A diagnosis may generally be made on the position of the lesion, the bubbling character of the râles, the absence of

apical disease in the opposite lung, and the recurrent bronchitic attacks. A careful history is of great value in deciding a diagnosis. These cases, when the lesions are considerable, are of serious outlook, and many die of complications before adult age is reached.

Pulmonary Collapse. Collapse of a temporary nature is very apt to occur in children of poor physique, and often leads to error in diagnosis. For this reason a single examination can never decide the diagnosis in a difficult case. The regions most commonly affected are the apex, the middle lobe, and more rarely the base behind. The signs present themselves as impairment to percussion with or without feebleness of breath-sounds, according to the condition of the surrounding lung. As a rule movement, and this is important in diagnosis, is hardly or not at all impaired. Deep breathing may clear the area, but the signs may reappear after an interval, and may sometimes be present for weeks together. Bronchial catarrh is often a factor, and mouth-breathing is a common cause, so that the condition is often found in children with adenoids in the naso-pharynx. Pulmonary collapse is not infrequently mistaken for the onset of tuberculous consolidation, and there is reason to believe that it predisposes to this.

Dental Conditions.

Separate attention must be paid to milk and to permanent teeth.

Milk Teeth. Among the well-to-do these should be as carefully preserved as the permanent set, but in the elementary school it is obvious that advice on these lines is valueless. The practical points to be attained are (*a*) cleanliness, (*b*) the removal of septic stumps where these are many or health is bad. It must be seen also that there is no tenderness which prevents efficient mastication.

Permanent Teeth. The preservation of these teeth should be especially aimed at, and with a view to this the following points must be noted: (*a*) Cleanliness, (*b*) number of fillings needed, (*c*) number of extractions

required. The poorer the children the more should attention be concentrated on the permanent as opposed to the temporary dentition.

Naso-Pharyngeal Affections.

The presence of mouth-breathing should first be noted, whether this is associated with the presence of nasal discharge, and whether these conditions are of chronic or temporary character. The amount of nasal obstruction may be gauged by an attempt at nasal breathing with the mouth closed. The tonsils should then be examined, but exploration of the naso-pharynx with the finger is no part of the duties of a school doctor, and its practice is only likely to foster opposition to medical inspection on the part of the public.

Glandular Enlargements.

Some enlargement of the neck glands is nearly the rule among children of elementary school class, and generally results from pediculi, carious teeth, and skin lesions the result of dirt. Such chronic irritation of glands is very favourable to the growth of the tubercle bacillus, but it is often extremely difficult to decide whether chronic enlargement of glands is of tuberculous or other nature. Especially puzzling are shotty glands found extending down the posterior border of the sterno-mastoid muscle; these are very commonly felt, and seldom give rise to trouble, but are probably tuberculous in most cases, and occasionally prove their nature by further enlargement and softening.

Aural Examination.

The examination of the ear resolves itself into that of ear discharge and deafness.[1] The *discharge* is often obvious to both eye and nose, but it may be absent at the time of examination and only a history be obtainable. The use of the speculum for school inspection is a matter which must depend on the skill and inclination of the school doctor, and also on the special facilities at his disposal.

[1] This subject is fully dealt with in Chapter XI.

Hearing may be tested in older children with a watch held at measured distances, the distance for average hearing being first ascertained. For young children this method is useless, and the use of whispered commands may be substituted. For this purpose the child is placed at a distance and told in a clear forced whisper to "put the tongue out," "touch the tip of the nose," etc. The carrying power of the whisper must first be tested on normal children. The object is to discover children in whom deafness is likely to interfere with school work, and for this purpose such a test is usually of sufficient accuracy, guarded as it is by investigation into the question of naso-pharyngeal obstruction and ear discharge.

Eye Conditions.

This subject must be approached mainly from the educational point of view, and on this account divides itself naturally into three branches: (1) Routine vision testing; (2) the noting of squint and external eye diseases; (3) investigation of symptoms referable to errors of refraction.

(1) Routine vision testing is best left to the school teachers, the school doctor only dealing with those below a certain standard of vision. For school purposes the two eyes may be taken together and only distant vision tested. It is obvious that methods applicable to school vision-testing are bound to miss many cases of hypermetropia and astigmatism, but a proportion of these will reveal themselves under other headings with conjunctival injection or headache. Spasm of accommodation is readily detected by the distant vision test, though the nature of the defect is only made evident when the refraction is investigated under atropine.

(2) Cases of squint in the young and external eye diseases are to be noted and advised to seek treatment.

(3) In this group will come cases of headache and migraine sufficiently troublesome to be referred to the school doctor. The higher up in the social scale is the school, and the more time is at the hands of the school

doctor, the greater will be the number of these cases for his consideration.[1]

Nervous System.

Here, in addition to structural diseases of the nervous system, special attention must be paid to conditions so closely related to school life as chorea and habit spasm, and above all over-pressure.

Over-pressure is any amount of pressure which leads to over-fatigue, and hence is a purely relative quantity depending on the balance between resistance and strain.[2] So many factors come into play in an individual case that it is often difficult or impossible to sift their relative importance.

The causation may be divided into (1) predisposing, and (2) exciting, and the former consists of such conditions as general delicacy, post-febrile debility, puberty and rapid growth, underfeeding, insufficient air and insufficient sleep. The exciting causes are many, and may be divided into those acting (1) within, and those acting (2) outside the school. Among the former may be mentioned over-length of individual lessons and of school hours, bad arrangement of tasks, and preparation for examinations. In addition it must be remarked that any defect in those sense organs, the eye and ear, which are the channels of education, must, by increasing strain, lead to over-fatigue. Causes which act outside school are excess of homework, private lessons (especially in music and languages), evening entertainments, and, among elementary school children, employment outside school hours.

The symptoms of over-pressure are those of fatigue unremoved by rest. There is a depression of mental functions shown by loss of cheerfulness, loss of power of concentration, and sensations of weariness. Headache, sleeplessness, and irritability of temper are common accompaniments.

[1] This subject is fully dealt with in Chapter X.

[2] See papers dealing with "School Work in its Relation to—(*a*) The Duration of the Lessons; (*b*) The Sequence of the Subjects; (*c*) The Season of the Year," in Transactions of Second International Congress of School Hygiene, London, 1907. Vol. I. London: Royal Sanitary Institute, 1908. 5s.

To the school doctor the case reveals itself in the appearance of the sufferer. The child is pallid and sallow, with dark lines under the eyes; the attitude is listless, the movements inelastic. Facial expression is dulled, and there may appear such muscular incoordinations as stammering, frowning, fidgetiness, and habit spasm. Loss of appetite, loss of weight, and constipation are common accompaniments.

Over-pressure, as it is found in the elementary schools of this country, is largely a relative over-pressure due to conditions of poverty, ill-feeding, bad air, and neglect. Such children are totally unfit to bear the strain of schooling, and present a problem to the local education authorities for which, at present, no solution has been offered. At the same time it must be remarked that the five-hour day is too long for the health of infants between 4 and 7 years of age, and the army of the unfit is needlessly recruited from the infant school by these victims of bad air and restricted freedom.

Mental Conditions will be considered in another portion of this volume.[1]

Recommendations.

Recommendations will obviously be the interpretation of the "summing-up" in terms of advice to mother and teacher. It is surprising how seldom in the routine inspection of an infant department there is no advice to give with a view to the cure or avoidance of disease. Nearly always a word is required as to the hygiene of teeth, skin, hair, or clothing, and but too often an injunction to seek medical advice is needed. The beginnings of disease are as rife in the infant school as in the out-patient department of a children's hospital.

Under *non-essentials* has been placed the group of "family conditions," not because the information at which it aims is unimportant (it is of the utmost value!) but because it is difficult to obtain and not always credible. The most reliable details under this heading are obtained

[1] See Chapter XIII.

from the boys and girls themselves through the medium of the teacher who knows them most intimately.

In conclusion it may be remarked that a pleasant relationship to child, teacher, and parent is essential to the success of the school doctor. He is placed in the school not only to collect facts, not solely to learn, but also to teach and advise—the teacher in the application of the laws of health to the work of the school; the parent and child in the value of personal hygiene, and the avoidance, through timely care, of the by-ways which lead to disease.

REFERENCES.

The school doctor will find the following works dealing with the clinical examination of children useful for purposes of reference:—

Ashby, H., and Wright, G. A.: "The Diseases of Children: Medical and Surgical." 5th edition. London: Longmans, Green and Co., 1905. 21s. net.

Bury, J. S.: "Clinical Medicine." London: Griffin and Co. 1894. 21s.

Emerson, C. P.: "Clinical Diagnosis." Philadelphia and London: J. B. Lippincott Company, 1906. 21s. net.

Forsyth, W.: "Children in Health and Disease." London: John Murray, 1909. 10s. 6d. net.

Goodhart, J. T., and Still, G. F.: "The Diseases of Children." 8th edition. London: J. and A. Churchill, 1905. 12s. 6d. net.

Holt, L. E.: "The Diseases of Infancy and Childhood." 4th edition. London: Sidney Appleton, 1907. 25s. net.

Hutchinson, R., and Rainy, H.: "Clinical Methods." 4th edition. London: Cassell and Co. Ltd., 1908. 10s. 6d.

Keating, J. M.: "Cyclopædia of the Diseases of Children: Medical and Surgical." Four volumes. 1889-90. 22s. 6d. net each. Supplemental volume v., 1901. London: Lippincott. 25s. net.

KERLEY, C. G.: "Treatment of the Diseases of Children." Philadelphia and London: Saunders and Co., 1907. 21s. net.

PFAUNDLER AND SCHLOSSMANN: "Diseases of Children." Four volumes. Philadelphia and London: J. B. Lippincott Company, 1908. £4 4s. net.

ROTCH, T. M.: "Pediatrics." 5th edition. Philadelphia and London: J. B. Lippincott Company, 1906. 25s. net.

SMITH, E.: "A Practical Treatise on Disease in Children." 3rd edition. Edinburgh and London: William Green and Sons, 1909. 21s. net.

STILL, G. F.: "Common Disorders and Diseases of Childhood." London: Henry Frowde and Hodder and Stoughton Ltd., 1909. 15s. net.

THOMSON, J.: "Guide to the Clinical Examination and Treatment of Sick Children." 2nd edition. Edinburgh and London: William Green and Sons, 1908. 12s. 6d. net.

IX

MEDICAL SUPERVISION OF GAMES, SPORTS, AND EXERCISES

BY

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IN matters relating to the physical welfare of the rising generation, this is conspicuously an age of alarm. Yet, whilst the cry of physical degeneration is on the lips of the majority and medical inspection of school children is becoming the rule rather than the exception, there will be found not a few who regard the medical supervision of school games as one manifestation of a dangerous tendency to "coddle," and who adopt the *laudator temporis acti* attitude arguing "when we were at school there was no medical supervision of games; we got on quite well without a doctor's interference; why not leave things alone, and let boys take their chance as they used to do?" This style of argument, backed up in some cases by a challenge to the school doctor to quote instances of boys who have suffered as the direct outcome of school games, demands a few words in justification of the system which it is my purpose to advocate and outline.

It will serve to make the point at issue much more clear if, before entering upon the main subject, we exclude entirely from our minds all consideration of harm resulting from athletics after the school age, *i.e.*, at the universities,

Woolwich, Sandhurst, or elsewhere. School-time is a much more hazardous time to most of us: the boy is becoming the man; the girl is developing into the woman; and there is no period in the life of a human being which requires more attention to physical needs than the period which roughly corresponds with the school age.

Is Medical Inspection of School Games Necessary?

In spite of the comfortable assurances referred to above that boys are just as well able to look after themselves now as in the "good old days," anyone who approaches the question seriously and with unbiassed mind cannot fail to decide in the affirmative, for even though we grant, for a moment, that no single case can be quoted of a boy or girl whose health has permanently suffered as the result of school games, how many cases there are of boys and girls passing through our schools whose physique, carriage, and outward appearance would obviously be the better for a course of systematic physical training or special exercises. If this be so, it is obvious that the object of medical supervision of school athletics, which justifies any trouble spent in its execution, is not merely to avoid disaster, but to make the most of the material provided, to trade with the talents entrusted, not to hide them in the earth.

But unfortunately the contention that in the past no harm has resulted from unregulated athleticism in schools is untrue. The question has recently been raised, argued, and finally settled by the discussion on the subject at the seventy-seventh annual meeting of the British Medical Association at Belfast,[1] when Dr. Clement Dukes quoted definite instances of serious injury resulting to schoolboys from overstrain on the football field and whilst running; and, even if the percentage of such cases is infinitely small compared with the number of those who have gone forth in the past unhurt or even the stronger for their athletics, yet for the sake of this small percentage medical supervision is not only expedient but imperative.

[1] For full report of the Discussion see *British Medical Journal*, 1909. Vol. II., p. 829.

There is another most weighty argument against the *laudator temporis acti* contention: it is simply this, that important changes have taken place in our great schools which have moved with the times. In matters of hygiene we have made more than fifty years' progress in the last half-century, and in our public schools the delicate boy now finds a place and thrives, where fifty years ago only the sturdiest could have weathered it out, whilst the weakling would have been entrusted to the care of a tutor.

It is the presence of the delicate boy that makes medical supervision of games and exercises not only advisable, but obligatory, and it is owing to such supervision, in a large measure, that the advantages of a public school education —mental, moral, and physical—are thrown open to weak and strong alike.

But some critic will say that it is the duty of a boy's parents to find out before he enters his school for what physical exercises he is fit: he should be examined at home by the family adviser, who understands the child's constitution better than a stranger who examines him for the first time. Now without wishing to under-estimate the value of the advice of the family doctor on such matters, it must be remembered in the first place that he is not on the spot, and cannot therefore appreciate the severity of the strain entailed by the various grades of exercise in vogue at any particular school. Secondly, the medical supervision of boys and girls is a special branch of medicine, and should be in the hands of one who has had special experience in that particular line. Thirdly, a child at school is living as a member of a body, and should be governed in all matters by the recognised officers of that body, and it is just as essential that promotion in grades of exercise should eventually be at the discretion of officers of that body as promotion in other educational branches.

Aim and Scope of Direct Medical Supervision of Athletics in Schools.

Occasionally, and happily rarely, gross organic disease of some organ is discovered for the first time by the school

medical officer in the course of his routine examination of a new boy on his entry to the school: in such cases medical inspection may be instrumental not only in the improvement of health by recommending this or that gymnastic course, but actually in the averting of serious disaster by forbidding the patient all exercise involving competition and strain. It is, therefore, in my opinion not only advisable, but absolutely imperative that every new boy admitted to a big boarding school should be thoroughly overhauled by the officer of that school before he is allowed to join in the school games.

There is a far larger class of boys who, on entering our boarding schools, owing either to constitutional weakness or to the great strain thrown upon a naturally healthy constitution by the onset of puberty and excessive growth, are fit for some, but not all, of the usual exercises in vogue at the school. Concerning the latter class, the medical inspector must advise a watching policy; as Dr. Clement Dukes has aptly put it: "No physician can certify that the boy can run, although he may sometimes be able to say that he cannot," and I am in the habit of recommending for every boy, whether he appears to be constitutionally strong or the reverse, that "I see no reason why he should not play all the usual games and go the recognised runs as he proves his fitness for them, beginning with the easiest."

Again, it is common for the medical officer to discover slight structural defects such as flat-foot, scoliosis, and the like, which can be corrected by appropriate exercises, or sometimes more serious conditions such as undescended testicle, hernia, etc., which, if left alone, tend to get worse with violent exercise, whilst immediate treatment may save much possible trouble in the future.

Lastly there are in most schools certain very severe trials of endurance. I have in mind the long competitive cross-country runs with a chance for the ambitious to "break a record." Whilst I should be loth to see such competitions abolished, I am of opinion that the number of boys of public school age who are able to take part in them with safety is very small, and that every boy should be

examined on every occasion before being allowed to do so, and should produce evidence that he has already taken part in similar competitive events without undue fatigue or distress.

Indirect Supervision of Athletics by the School Doctor.

Whilst the medical officer should exercise direct medical supervision on the lines already indicated, there are many subjects closely bearing upon school athletics in which, by his advice and guidance, he should exercise an indirect but keen supervision.

Training is a question upon which the school medical officer is sometimes asked to advise, and it certainly is a subject which requires his supervision.

In the eyes of the school-boy it is often synonymous with a rigid exclusion of sweet stuff from the diet, and there is little idea of any special modification of training for a special object. Thus for football, long-distance running, sprinting, gymnastic competitions, etc., etc., "training" usually consists in refusing pudding at dinner and abstaining from sweetmeats.

In a recent lecture at Rugby School I pointed out that the danger with school-boys lay in over-exercising or over-training, and that the captain of games would be well advised to allow his team an occasional "day off," to be spent either entirely at rest or in one of the exercises in which accuracy of eye or agility is of more importance than endurance, such, *e.g.*, as fives. When I quoted later on in the lecture passages from a well-known text-book on diet which conclusively proved that sugar was the best food-stuff for those whose endurance was to be put to the test, surprise and, at any rate at first, incredulity resulted.

While the medical officer should supervise the system of training, he should exercise a most rigorous supervision of boys who are "out of training."

In some schools the medical officer, not being a recognised officer or member of the staff of the school, is not summoned except for cases of illness which are obviously

acute or which do not clear up after a day or two's rest in bed or in the sick-room. This is a most undesirable state of things; there are many boys in whom the frequency of trivial disorders is one of the best indications of their weakness, and it is by his knowledge of every little detail, however trifling, in a boy's bill of health, that the medical officer is able to judge of his fitness to join in school games. It should be an unalterable rule that every case of sickness, however trivial, should be brought before the notice of the school medical officer, and that in no case should a boy who has stayed out of school for any kind of indisposition be allowed to join again in the ordinary school games without the medical officer's express permission.

There is nothing which is so apt to weaken a boy's power of endurance as a febrile attack, however mild, and after such attacks he must get into training again gradually and cautiously.

As regards diet, again, the medical officer's advice should be more frequently consulted.

It is my experience that many boys refuse to eat a sufficiently large mid-day meal on days when they are to play strenuous games within two hours of dinner: they will for that reason frequently refuse the pudding, and sometimes the meat provided, and go without rather than run any risk of damaging their "wind."

I have already pointed out the great value of sugar to the boy in training, and that a school boy, at any rate in the football and running season, should always be more or less in training. He cannot afford to lose the sugar or the starch of which his pudding course mainly consists, and it is obvious that there should be a special arrangement of meals for whole school days and half-holidays respectively, and that the medical officer should superintend this arrangement.

There are many other important details relating to games over which medical supervision should be maintained, such as bathing arrangements, changing into suitable clothes, and the like. It is impossible here to enter

into these questions in any detail. It must suffice to say that in such matters a satisfactory result can only be obtained by a close co-operation between the medical officer on the one hand and the masters and senior boys on the other, whilst the importance of the superintendence of a capable house matron can hardly be overestimated. In many schools masters are appointed with a view to their exercising special superintendence over the various branches of school athletics: it would be well if more attention were paid to the special qualifications necessary to make them more competent to observe and advise in these matters.

No boy should be sent to a public school who is permanently excused all games: he should stay at home and work with a tutor or be sent to a special school. For such boys as are excused runs or football temporarily the medical officer should prescribe a course of exercise to be taken under the supervision of school authorities. I have known a boy on the ground of heart-strain excused runs and allowed to play golf. Nothing could be more inappropriate than this treatment. The easiest grade of runs, with frequent halts, so that there is never severe dyspnœa, is ideal exercise, under supervision, for a toneless heart; whereas the drive at golf, with its concentration of exertion into one sudden stroke, is much more likely to prove disastrous than the runs for which it is substituted. Again, in most institutions golf cannot be played on school grounds, and it is most essential that a boy should feel that his play as well as his work is part of his school life. Boys excused school games are apt to loaf. It should be the duty of the medical officer to find games suitable to the weakest of the boys under his charge.

The Principles underlying the Medical Supervision of School Games.

It is obvious that while the school medical officer should be primarily responsible for the supervision of games, success must depend not only on his care and exertion, but, as has already been pointed out, on the co-operation

of others and on the system which they adopt. In order to work satisfactorily *games must be graduated*, and the pupils must not be arranged primarily by boarding-houses, forms, or age for the purpose of games, but by their physical attainments, just as the classes in which boys work are determined by their intellectual attainments.

Medical Supervision of Athletics in Girls' Schools.

I have so far dealt almost entirely with boys' schools. In the case of girls a somewhat modified supervision will be necessary. There are some who maintain that girls should not go in for athletics: that it destroys their natural elegance, spoils the figure, and the like. It would only be a waste of words to treat such arguments, or rather statements, seriously; and it is probable that the introduction of systematised athletics into girls' schools has done as much for the health of the nation at large as any other movement in hygiene in the last fifty years. In the case of girls a preliminary medical examination is just as necessary as with boys, and, in large girls' schools, there should be one recognised medical officer in charge; but the medical supervision need not be so searching after the initial inspection, since the games commonly played at girls' schools are not so great a tax upon their strength as football and running are to boys at school.

Moreover, in girls' schools, the pupils are always kept much more strictly under the supervision of their mistresses, and the boarding-houses are generally smaller than those in boys' schools, whilst the life is distinctly more comfortable and less barrack-like. Consequently the boarders and their mistresses live a more domestic life together, and small disorders of health are more easily recognised and more promptly treated. I would repeat, however, that a preliminary medical examination is just as necessary, if not more so, than in the case of boys, for girls are even more liable than boys to suffer from scoliosis and other slight orthopædic deformities, which, if recognised early, and treated appropriately by proper exercises

and gymnastics, may be completely cured, whilst, if neglected, they may become exaggerated and finally permanent.

Medical Supervision in Preparatory Schools.

Much of what has been said about girl's schools applies to preparatory schools for small boys. Here, again, there is much more supervision of masters over boys, and life is apt to be much less strenuous than in the public schools, whilst the period of life is not so critical as the public school age. None the less, the well-advised head master will require every boy to be specially examined either by the family doctor at home, or, failing that, by the medical officer who usually attends the boys in sickness on his entering the private school.

Medical Supervision in Elementary Schools.

When one turns to elementary schools circumstances and conditions are so different that it would be impossible in so short an article to deal satisfactorily with the question of physical exercises and games in them. It must suffice to refer the reader to the Syllabus of Physical Exercises for Public Elementary Schools recently published by the Board of Education,[1] in the preface to which the subject is discussed at some length and much excellent advice is to be found.

The importance of medical inspection of the pupils in elementary schools is well illustrated by the following quotation from a statement made by the Medical Officer to the West Riding County Council at the Health Congress held in Leeds, July, 1909:—

"According to revelations disclosed by inspections already undertaken there must be, at the lowest computation, four million eight hundred thousand children in our elementary schools who cannot be described as sound in body and mind, and, amazingly enough, these infirmities are largely removable, if dealt with sufficiently early, and preventable."

[1] Syllabus of Physical Exercises for Public Elementary Schools. London: Wyman and Sons, 1909. 9d.

The Comparative Value of Various Athletic Pursuits.

In conclusion a few words must be devoted to the relative importance of various games, sports, and exercises from a medical and educational point of view.

There are some who urge that in England we think too much of games generally in the training of our rising generation. Others insist that to our system of school games we owe many of our best national characteristics, our greatest imperial triumphs.

From a purely medical point of view I think it would be difficult to lay too much stress upon the importance of games and sports in the school curriculum. The danger more probably lies in undue importance being attached to one or two particular games. Excellent as are football and cricket, not only for the physical training they demand, but also for the moral and educational lessons they teach, there are a number of other exercises and games which appear to me to deserve more attention than they now receive, and the introduction of which more generally into our great schools would not only tend to do away with the liability of some boys to grow stale to cricket and football, but might prove of more immediate use both to the individual and perhaps to the State.

Without discussing such games as fives, lawn tennis, racquets, etc., I will merely state that I refer more especially to those sports and exercises which have a direct bearing on the preservation of life whether of the individual or of the State. Thus, under the former head I include swimming and rescuing the apparently drowned, boxing, fencing, etc., and I would maintain that they stand criticism as exercises not only on their own merits, but as a means of training for other forms of exercise such as football and rowing. They are pursuits which entail little expense, can be followed without waste of time, in the open air or indoors, and which deserve to become more universal than they are at present.

Under the latter head I include military and other forms

of drill, and I have no hesitation in saying that it would be beneficial to most schoolboys to be put through a regular systematised course of physical exercises.

In Austria, Belgium, Denmark, France, Germany, Holland, Hungary, Norway, Sweden, and Switzerland physical exercises are a recognised part of the school curriculum, and are for the most part obligatory on all who attend the schools. They are usually taught by specially trained instructors whose social status differs little, if at all, from that of the other school teachers.

It is impossible here to enter upon a comparison or discussion of the various systems of physical drill: more depends upon the observance of system and upon concentration of attention than on the exact form of system adopted; but it is significant of the times that there is a growing tendency towards universal adoption of Swedish gymnastics in our schools, and that the importance attached to our officers' training corps is increasing not only amongst outsiders but also among boys, parents and masters in the great schools of the United Kingdom.

REFERENCES.

For a full discussion of all matters relating to the nature, conduct, effects and supervision of physical exercises reference should be made to the recently-published monumental work of Professor Tait McKenzie, M.D., "Exercise in Education and Medicine." Philadephia and London: W. B. Saunders Co., 1909. 15s. net.

The following should also be consulted:—

Bum, A.: "Mechanotherapie," in "Encyclopedie der Heilkunde von Euleuberg XV." Wien: 1897.

Busch, F.: "Ziemssen's Handbook of General Therapeutics." V. London, 1886.

Checkly: "Natural Methods of Physical Training," Pub. 1904. 3s. 6d.

Cohen: "System of Physiologic Therapeutics." Vol. iv. 11 vols. London: Rebman, 1901-1904. 7s. 6d. net each vol.

CORNER, E. M.: "Physical Exercises," in "A System of Medicine," edited by Sir Clifford Allbutt and Dr. H. D. Rolleston. Vol. i., p. 382. London: Macmillan and Co., 1905. 25s. net.

DUDLEY, G., AND KELLOR, F. A.: "Athletic Games in the Education of Women." New York: Henry Holt and Co., 1909. $1.25 net.

GRAFSTROM, A. V.: "Medical Gymnastics." London: Scientific Press, 1899. 2s. 6d.

HANCOCK, H. I.: "Physical Training for Children by Japanese Methods." London: Putnam, 1904. 5s. net.

JOHNSON, T.: "Swedish System of Physical Education." 3rd edition. Bristol: J. Wright and Co., 1899. 1s. net.

LEHMANN, R. C.: "Rowing." (The Isthmian Library.) London: Innes, 1897. 5s.

MACLAREN, A.: "Training in Theory and Practice." London.

MELLIS: "Manual of Swedish Drill for Teachers," 1902.

MORGAN, J. E.: "University Oars; being a critical inquiry into the after-health of the men who rowed in the Oxford and Cambridge Boat Race from 1829 to 1869." London, 1873. 10s. 6d.

MILES, E.: "A Boy's Control and Self-Expression." Cambridge: The Author, 1904. 3s. 6d.

NEWSHOLME AND PAKES: "School Hygiene." London: Swan Sonnenschein and Co., 1903. 3s.

NOTTER AND FIRTH: "Theory and Practice of Hygiene." 3rd edition. London: J. A. Churchill, 1908. 21s. net.

OSTROM, K. W.: "Massage and Swedish Movements." 6th edition. London, 1906. 3s. 6d. net.

POSSE, N.: "The Special Kinesiology of Educational Gymnastics." Boston: Lothrop, Lee and Shephard Co. 12s. 6d. net.

RIVIERE, C.: "A Natural Experiment in Cardiac Strain." *British Medical Journal*, September 25th, 1909.

SCHMIDT, F. A., AND MILES, E.: "The Training of the Body for Games, Athletics, Gymnastics, etc." London: Sonnenschein, 1901. 7s. 6d.

STEMPEL, T. D.: "Physical Exercises for Girls." London: Andrew Melrose, 1904. 1s.

TANNER, A. E.: "Physical Culture." London: Simpkin, 1894. 2s.

TUBBY, A. H.: "Deformities: a Treatise on Orthopædic Surgery." London: Macmillan, 1896. 17s. net.

ELSTON, F.: "Organised Games." Leeds: E. J. Arnold and Son Ltd., 1908. 4s. 6d. net.

See also:—

"Pocket Manual of Home Exercises." Published by Spencer, Heath and George Ltd., 18 and 52, Goswell Road, E.C., Manufacturers of Gymnastic Apparatus. 6d.

Reference should also be made to the following reports:

"Anthropometric Investigation in the British Isles." From the Report of the British Association. Dublin, 1901.

"The Organisation of Physical Training in Sweden." Board of Education Educational Pamphlet No. 11. (Not on sale; to be consulted at the Board of Education Library, Whitehall, S.W.)

"Physical Education in Foreign Countries: Report on Replies to Questions circulated by the Joint Committee on Physical Education." London: National League for Physical Education and Improvement, 1909. 6d.

"A Syllabus of Physical Exercises for Public Elementary Schools," issued by the Board of Education. London: Wyman and Sons, 1909. 9d.

See also lecture by Dr. Doléris on "Les Sports au point de vue de l'hygiène chez la femme et la jeune fille," and papers and reports of discussions in "Transactions of Second International Congress on School Hygiene," vol. i. London: Royal Sanitary Institute, 1908. 5s.

X

THE EYES AND EYESIGHT OF SCHOOL CHILDREN

BY

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To the study of the eye more than to anything else the rapidly successful modern development of school hygiene is indebted for its initial impulses. Nor need we wonder at this, for, as Goethe reminds us, "the sight is the finest of the senses. The other four teach us only through the organs of contact. We hear, feel, smell, and touch everything by means of contact, but the sense of sight stands far higher, is refined above the material, and approaches the faculties of the mind itself." Almost any other sense-organ can bear up through defect and obstruction with less penalty to the independence and effective usefulness of the individual. It was only natural then that the study of the causes underlying blindness and defective vision should reveal much that was owing to an ignorance of the principles bearing upon the development of this delicate organ, and of the due regulation of its tasks and capacities.

HISTORICAL REFERENCES.

Although Beer, as early as 1800, published in Vienna a work on "The Treatment of Healthy and Weak Eyes," and in it directed the attention of teachers to the proper care of the eyes of their pupils, English workers have had

some share in the development of this branch of hygiene, for in 1812 James Ware read to the Royal Society of London a paper on "Observations relative to Near and Distant Sights of different Persons," and pointed out the evil effects produced by the conditions associated with progressive civilisation.

Mr. Priestley Smith, in 1880, called attention to the same fact in an address to Birmingham teachers on "Short-sight in relation to Education." It was not till 1882, in Eulenberg's Technical Encyclopædia, that Herman Cohn, of Breslau, after many years of patient investigation, conspicuously drew attention to the causes at work during school life in the production of myopia. The foundation of this article was the examination of over 10,000 children in 1865-6. It was entitled "School Children's Eyes," and was a year later expanded into a formidable volume, "The Hygiene of the Eye in Schools," and with its remarkable final chapter on "The School Doctor" and his duties, may be said to be of epoch-making importance. The monumental character of this work may well be said to have earned for Cohn the title of the father of School Medicine.

From that time onwards school hygiene has progressed much more rapidly abroad than it has in our own country, but at length the Education Act of 1907, imposing upon local authorities the *duty* of providing for the medical inspection of school children and granting *power* to attend to their health and physical condition according to directions which may from time to time be issued by the Board of Education, has done tardy justice to the clamant requirements of the growing children of the nation.

Investigations and Results.

Investigations into the visual acuity of children in British elementary and other schools have been carried out by various observers with widely differing results. As far as possible the following statistics have been selected on the ground that the inquiry has been made by competent

ophthalmic surgeons on scientific lines—*e.g.*, not solely by means of test-type trial, but this verified by ophthalmoscopic investigation.

In 1890, Dr. G. Ferdinands published his investigations into the eyesight of children aged 7 and upwards attending some of the Aberdeenshire Board schools, from which I have extracted the following results:—

TABLE INDICATING PREVALENCE OF DEFECTS OF VISION IN SCHOOL CHILDREN OF ABERDEENSHIRE.

		Myopic.	Per cent.	Hyper-met.	Per cent.
Country Schools—					
Boys	573	37	6.4	55	9.5
Girls	442	37	8.3	47	10.6
Total	1015	74	7.2	102	10.0
City Schools—					
Boys	891	133	14	180	20
Girls	793	118	14	180	14
Total	1684	251	14	360	21
Higher Grade Schools—					
Boys	303	69	22.7	36	11.8

It will be noticed from these figures that the country schools show a decided superiority over city schools, and that the worst results were found in the higher grade schools.

Mr. Priestley Smith examined a large number of children in Birmingham with the following result:—

Board Schools—1,600 children examined with 5 per cent. myopia.

Training College—350 teachers examined with 20 per cent. myopia.

It is interesting to compare these results with those similarly secured and tabulated by Cohn in 1865-6, when he examined 10,060 children. He found in—

5 Village schools ... ... 1.4 per cent. myopia
20 Elementary town schools 6.7 „ „
2 Higher girls' schools ... 7.7 „ „

2 Middle schools	...	... 10.3 per cent. myopia
2 Polytechnics	...	... 19.7 „ „
2 Gymnasia	...	... 26.2 „ „

Here we see the same facts displayed in still more emphatic form, the comparative immunity from myopia of the country child, and the great increase as the children surmount the constantly growing educational difficulties in their path from primary school to university. In 1902 at the request of the School Board eight ophthalmic surgeons investigated the eyes of 20,744 children in the elementary schools of London of ages varying from 6 to 14 and chiefly above Standard II.

TABLE SHOWING CONDITION OF VISION IN LONDON CHILDREN.

Sex.	Good ($\frac{6}{6}$).	Fair ($\frac{6}{9}$, $\frac{6}{12}$).	Bad ($\frac{6}{18}$, or worse).
Boys ...	8,038 ...	1,786 ...	645
Girls ...	7,301 ...	2,092 ...	882
Total ...	15,339 ...	3,878 ...	1,527
Per cent. ...	73.9 ...	18.6 ...	7.3

In the same year an investigation was also made of the eye conditions of 2,782 children in infant departments by Dr. Kerr, Dr. Critchley, and Miss Sayer, which elicited the following results:—

Ages.	6-6½	6½-7	7-7½	7½-8	8-8½
Good ($\frac{6}{6}$) ...	81.7	79.3	79.4	78.3	74.2
Fair ($\frac{6}{9}$, $\frac{6}{12}$) ...	14.8	15.2	15.1	15.3	18.0
Bad ($\frac{6}{18}$, or worse)	3.5	5.5	5.5	6.4	7.8

A scrutiny of these figures shows that with each year of school life there is a decline in the percentage of those with good vision and an increase of those with only fair vision, whilst the regular rise in the percentage of those classed as "bad" is particularly noticeable, and the numbers approximate very accurately at 8-8½ years to those shown in the preceding table. (Compiled from the First Annual Report of the Med. Off. School Board for London, 1903; p. 14 *sqq.*)

In the same officer's reports for 1904-5 further statistics of the continued work of the ophthalmic staff are detailed, which bear out the results noted above, the number examined reaching the very large total of 61,676—32,013 boys and 29,663 girls.

Concisely stated, the following were the results:—

	Good ($\frac{6}{6}$)	Fair ($\frac{6}{6}$ $\frac{6}{12}$)	Bad ($\frac{6}{18}$ worse)	Total
Boys	24,099	5,311	2,603	32,013
Per cent.	75.2	16.5	8.1	
Girls	20,404	6,143	3,166	29,663
Per cent.	68.7	20.6	10.5	
B. & G., per cent. ...	72.1	18.5	9.3	61,676

It will be seen that there is here a close approximation to the results of the first ophthalmic investigation in 1902, which, as already mentioned, showed 73.9, 18.6, and 7.3 respectively. The main conclusions drawn by Dr. Kerr from these figures are stated briefly in his reports for 1903 and 1905, viz., that a constant number of about 10 per cent. have bad vision ($\frac{6}{18}$ or worse); very bad vision ($\frac{6}{36}$ or worse) due to accident, disease, spasm, or myopia increases regularly from 1.5 per cent. in Standard I. to 3.5 per cent. in Standard Ex. VII.

On perusing a large number of the first annual reports of various school medical officers giving the results of the eye-testing carried out according to the instructions given in the suggested schedule for Medical Inspection (Circular 582 Board of Education), one is struck by the wide divergence of the results obtained. In some instances no doubt the testing has been relegated to the teacher or nurse or carried out by officers so new to eye-testing work that proper allowance may not have been made for letter ignorance, slowness and shyness of the children, pressure on the eyes in testing, bad illumination of test types, inaccurate distance, etc., which further practice and experience will largely obviate. Thus in one report we read: "The number of cases of defective vision reached among the

older children 18 per cent., among the younger children only 2.9 per cent., but on account of the difficulty of examination in them this figure cannot be considered accurate." From the report of another area where eleven medical officers were engaged in the inspection, we learn: "In our returns we find percentages below normal for the various schools, varying from 6.5 to 77.8. It is perfectly evident that there has been a lack of uniformity in the methods of examination." This diversity is drawn attention to in the first report of Dr. George Newman, Chief Medical Officer of the Board of Education:—

TABLE INDICATING PREVALENCE OF DEFECTS OF VISION IN SCHOOL CHILDREN.

Area.	Number of Boys and Girls examined.	Percentage ($\frac{6}{18}$ or worse).
Accrington	640 ...	5.0
Ashton-under-Lyne ...	851 ...	8.3
Beverley	750 ...	9.5
Cardiff	1,919 ...	10.9
Flintshire	735 ...	15.8
Gloucestershire ...	712 ...	10.1
Rochdale	695 ...	21.6
Shipley	787 ...	8.1
Surrey	4,288 ...	4.9
Worcestershire ...	6,584 ...	9.3
Yorkshire (E.R.) ...	643 ...	11.5
To these may be added from other sources—		
Brighton	3,342 ...	8.2
Ipswich	2,200 ...	21.0
Warrington	968 ...	14.0
York	1,945 ...	17.0

The deduction made by Dr. Newman from the figures at his disposal is that "in regard to the children about to leave school approximately 10 per cent., rather more in the case of the girls and rather less in the case of the boys, were in need of careful examination by an ophthalmic surgeon, their vision being $\frac{6}{18}$ or worse. This may probably be

taken also as approximately the number of school children of all ages who need treatment for visual defect."

We have then from this report confirmation of the results arrived at through more strictly scientific methods by the oculists employed by the London Education Authority in 1902 and subsequent years, when the very large numbers of children examined would lead us to regard the deductions made as quite reliable.

Nature of Defects.

When we come to inquire into the character of the visual defects our task is not so easy. Many of the returns make no attempt to resolve the results, simply classing them as $\frac{6}{9}$, $\frac{6}{12}$, $\frac{6}{18}$, or worse, etc. The first table in this chapter, compiled from Dr. Ferdinand's investigation, gives us some information, and for a fuller analysis we may again consult the admirable reports of Dr. Kerr made to the London County Council in 1905: "Dr. Hugh Thompson found that among 1,732 children who had bad subnormal vision, out of a total class register of 24,099 children (7.1 per cent.), the errors of hypermetropia, hypermetropic astigmatism, mixed astigmatism, and myopia with myopic astigmatism were in about equal proportion, and the myopia appeared to increase in the higher standards at the expense of the astigmatism" (p. 57).

Mr. Bishop Harman, at the Belgrave and Middlesex Hospitals, analysed the cases referred there from the schools inspected, and found in 1,100 children the following distribution of defects:—

TABLE INDICATING VARIETY OF VISUAL DEFECTS.

	Hyper-met. 1	H. Astig. 2	Mixed Astig. 3	Myopia. 4	Myopic Astig. 5	Odd Eyes. 6
Boys ... 482	41.7	28.2	7.0	10.4	10.5	2.0
Girls ... 618	43.2	29.0	7.1	8.4	10.2	2.1
Total ... 1,100	42.5	28.6	7.1	9.3	10.4	2.0

If columns 3, 4, 5, and 6 are added together, not quite twenty-nine cases per hundred are found to be myopic, and as the defect cases are barely 10 per cent. of the children examined, it follows that one-tenth of twenty-nine (or hardly 3 per cent.) of the children in school can be classed as myopes. Mr. Harman also tabulates the above results according to their age incidence, from which it appears that hypermetropia shows a slow rise from 28 to 33 per cent. of defects between the ages of 6 and 13, whilst hypermetropic astigmatism and myopia run parallel in a rise from 6 till about 10 years, when there is a steady rise in the myopia and a corresponding decrease in the hypermetropic astigmatism during the rest of elementary school life. These results confirm the earlier experience of Dr. Hugh Thompson above referred to.

The salient deductions as to the visual acuity of our elementary school children to be drawn from the various results tabulated appear to be—

1. That about 10 per cent. show grave errors of refraction, which may be roughly divided into 4.5 of of hypermetropia, 2.5 hypermetropic astigmatism, and 3.0 myopia, the last including myopic astigmatism.
2. That the number of myopes and the degree of myopia tend to increase the longer school life lasts and the greater the educational demands made.

Myopia.

An immense amount of investigatory work on similar lines to those detailed above has been carried out by various observers in Germany, Russia, France, America, and other countries, and for many years startling pictures have been drawn of the wide prevalence of myopia, its rapid increase with school life, and its formidable results in later life. The effect of this has been very salutary in the immense improvement of the conditions of school life as regards buildings, lighting, printing of books, arrangement of time-tables, curricula, etc. This hygienic activity

prevalent abroad has reflected itself in the steady direction and improvement of public opinion in this country, and has led to a deeper interest in school hygiene and its influence on the physical development of the young. Whilst this is a most excellent result, it would appear that fuller knowledge and a careful survey of more recent statistics tend to show that British school children do not manifest by any means so widespread an amount of myopia or of eye defects generally as has been found in other countries, notably Germany. The examination of large numbers of children of the alien colonies in London corroborates this.

Myopia may be briefly considered as falling into two divisions, first the simple or acquired myopia, which is the product of the environment and is really an occupational disease. The normal eye of infancy and early childhood is hypermetropic—the inherited type destined by nature to be protective in its uses to the individual and to be exercised in ranging over long distances, not "cribbed, cabined, and confined." Civilisation steps in and transforms, by continued usage at close quarters, the short axis of the flat eye into the longer one of myopia. Exactly how we need not wait to discuss. As has been aptly said, "myopia is the penalty of progress." The ordinary simple myopia does not usually show itself before 6 or 7 years of age, and continues to increase gradually in amount with continuous educational demands till 18 years or so, and does not commonly exceed 3.5 D in extent. As showing the influence of occupation, I have frequently found that after that age a change of work to, say, farm life, has resulted in a diminution of the amount of myopia. Exercise, again, in rifle shooting will have the same effect as I have found in members of Morris-tube and other range clubs.

The second class of myopia, however, is of a very different type. It shows itself earlier, is undoubtedly influenced by heredity, but probably rather as a manifestation of specific disease. It is rapidly and unlimitedly progressive, and results in middle or later life in choroiditis, reduced globe tension, fluidity of the vitreous, detachment

of the retina, and the risk of more or less complete blindness. It may well be termed "malignant" rather than simply "progressive." This is undoubtedly a condition of most serious consequence, and one very necessary to determine at as early a period as possible since all close work tends to rapidly accelerate the condition, and an early commencement of continuous anti-specific treatment is most essential. Cases of very early myopia should be most particularly noted and listed for regular and frequent examination at the school clinic, so that an accurate chart may be kept of its advance, just as a weight chart is registered in cases of tuberculosis. I do not think that malignant myopia exists to the full extent it has heretofore been assumed. Certainly it is not the direct product of school conditions. Nevertheless, it is a disease so serious in its results that all care should be taken to assure its early detection.

Tscherning,[1] in 1882-3, examined ophthalmoscopically 7,523 young Danish conscripts with the following results:

I.

Students	Myopia	32	per cent.
Clerks	„	16	„
Artists	„	13	„
Tailors, shoemakers, etc.	„	12	„

II.

Workmen (hard labour)	„	5	„
Agriculturists (peasants)	„	2	„

A further analysis as to the degree of myopia present showed—

Number.	Less than 9D Myopia.	Greater 9D Myopia.
I. 2336	17 per cent.	0.56 per cent.
II. 5187	3 „	0.73 „

It is interesting to note that the grosser myopia was really more widely distributed among Class II. This table is

[1] "Physiologic Optics," p. 85.

important too as showing the continuous association of myopia with occupations in after-school life.

It may be repeated, then, that at its inception there is nothing to distinguish simple from malignant myopia save its earlier onset and more rapid progress. Simple myopia is an occupational disease, slowly progressive up to a point, where it remains stationary. This is the generally prevalent form of myopia. On the other hand, the very much less common type of myopia, the malignant, or progressive, begins at an earlier age, is rapidly progressive, and is associated with pathological changes which conduce to more or less complete loss of vision. I have ventured to deal with myopia first, as it is the refractive error which has in all investigations absorbed most attention. As to the conditions influencing it, one may briefly note that it is abundantly proved that simple myopia is produced and fostered by the following:—hemmed-in school buildings, especially of the older ecclesiastical type of architecture with small stone mullioned windows; badly-lit class-rooms; well-lit rooms, but placing the desks so that the light comes from the front, etc., instead of from the left side; small-typed, ill-defined print; wrongly proportioned desks and faulty position of pupil; too close an approximation of the eyes to the work; fine sewing. Blackboards should not be grey and shiny, but of a dull, deep black colour, and the writing and diagrams should be of a large, bold size, so as to command ready recognition from the *most distant* seat in the class. Slates should be replaced by paper and ink, not pencil. Tasks involving minute work are absolutely unsuited to infants, who should not be allowed to use pens, pencils, or ordinary needles and thread. In the higher classes close work should alternate with recreative exercises or with work entailing less effort to the accommodation, and home work should be abolished or reduced to a minimum. All these are important determining factors in the development of myopia, and continued attention to them is necessary on the part of school managers and those responsible for the details of school construction and furnishing. Children found to be

suffering from myopia should be fitted with appropriate spectacles, care being taken not to over-correct, but to supply the *weakest* lenses that secure as nearly as possible normal distant vision. These should be worn constantly.

I do not think that sufficient attention has been drawn to over-heated, badly-ventilated class-rooms as associated with mal-development of the eyes, or yet to the part played by rickets, malnutrition, or the exanthemata. With regard to the last it has always seemed to me that it is not sufficient to observe the period of absence which is coincident with the time fairly accurately fixed as being necessary to prevent the spread of infection to others. The automatic return of children to school at the expiration of the segregation interval is one of the banes of our educational system under which grants are proportional to attendances. The more important point to determine is how soon (say after measles, scarlatina, etc.) may a child have sufficiently recovered its physical health to enable it to return to conditions of eye work, long hours of study, etc., that it may not thereby suffer. The effect upon the eyesight of the too early return to school after debilitating illnesses is, in my opinion, an important direction in which to seek for much of the eye trouble, external and visual, we find amongst our scholars. It would be more reasonable to draw up an exclusion list for infectious fevers based rather upon the grounds of safe return to school of the individual *as* the individual than as a possible source of infection to others. In the interest of the children's eyesight it would be more reasonable to direct that every case of specific fever should remain from school twice the length of time ordinarily allowed. A compensatory grant should be payable on the authority supplying a certificate from the school medical officer showing the absences due to such disease during the year. As to the reason why myopia appears to be so less evident in British than in Continental schools, and why the Britisher, with all his progress, has escaped better than his foreign neighbour, there are, of course, many suggested explanations, such as the manifest differences in national types, habits, pursuits, etc., but

Dürr gives an illuminating calculation as to the hours of study and recreation, viz. :—

In England pupils work	16,500	hours and play	4,500.
„ France	„	„	19,000	„	„	1,300.
„ Germany	„	„	20,000	„	„	650.

Evidently the "playing fields of Eton" have much to do with the battle against myopia. The fact that boys do not sew, that they play more than girls (who in their out-of-school time are perhaps more useful domestically) would also help to account for the comparatively lesser incidence of myopia amongst boys.

Hypermetropia, Etc.

Cases of hypermetropia and hypermetropic astigmatism constitute the major portion of the errors of refraction found in school children. Whilst it is often found that headaches constantly betray these conditions in adults, it is seldom we meet with them in the child. Convergent squint, styes, congestion of the lid edges and often of the conjunctiva, dryness and heat in the eyes, rubbing the eyes, and distaste for near work, are the commoner ways in which these errors show themselves, as well as in a blurring of the print, and dropping of stitches in sewing, etc. Bad writing and failure to keep to the lines also will often betray defective sight, whilst on the contrary a good writer suddenly becoming a bad writer is often one of the earliest evidences of chorea. Many a boy's disposition is dominated and his career directed by his refraction; *e.g.*, hypermetropia unrelieved makes near work positively painful and repugnant, whilst out-of-door sports are a relief to the tense ciliaries. "He is 'no good' at book-work," reports his tutor, "but very clever at games." Myopia shows itself too in the self-centred, bookish, hypersensitive boy, or the girl addicted to fine crochet or other minute work. The prescription of appropriate spectacles for cases of hypermetropia or hypermetropic astigmatism is essential for the relief of these conditions. All cases of convergent squint associated with hypermetropia should, at the very

earliest recognition of the defect, be so treated, otherwise the squinting eye is certain to become seriously and permanently reduced in vision. In spite of all unfortunate and too common assurances to the contrary, children rarely "grow out of" a squint, and irreparable damage may be done in the delusive hope that nature will retrace her steps. Paralytic strabismus should be carefully differentiated, and after diphtheria cases of this and of ptosis will be met with. They generally disappear under systematic treatment. In no case should prisms for diplopia be prescribed until at least six months' ameliorative treatment by exercises has been persevered with. Compulsory exercise of the amblyopic eye in convergent strabismus by shutting off the good eye by means of a shade for an hour or two in the day at intervals is very helpful, as also are exercises in combining pictures by means of the stereoscope. Direction exercises in cases of muscle paresis should be carried out by "fixing" an object held up in front of the eye—such as a finger or pencil—and moving these in the direction of action of the affected muscle, the head being kept stationary so as to encourage rotation of the eyeball in the desired direction.

Vision Testing.

For the actual testing of visual acuity as directed by the Board of Education, it is most important to carry out scrupulously every detail of the instructions. Failure in any one point may vitiate the whole results. The necessity for strictly adhering to the directions as to measurements, lighting, etc., were long ago insisted upon by various investigators (H. Knapp and others). Dr. T. Gayat read a paper at the fourth International Ophthalmological Congress at London in 1873, in which he stated that "varying extremes in the observance of practical rules may produce errors of greater or less magnitude, amounting in some instances to one-third of the entire acuteness" (Trans., p. 90). Procedure may be summarised thus:—

I. Hang on the wall, in a good light, a set of *Snellen's* test letters.

II. Draw a line on the floor at a distance of exactly six metres from the letters. Let each pupil in turn toe this line and try to read the letters line after line from the top. Each eye is to be tested separately, the other eye being covered, but *not pressed upon*, by a card held in front of it. Record the vision in the form of a fraction; *e.g.*—

$$\text{R.V.} = \tfrac{6}{6}. \qquad \text{L.V.} = \tfrac{6}{18}.$$

The numerator 6 representing the distance in metres, and the denominator the number of the lowest line of letters read. If none of the letters can be read at six metres, advance the child gradually towards the test type till the top letter is read, and mark the distance then as the numerator and 60 (the type number) as the denominator. If the child fails to decipher 60 at any distance, then ascertain at what distance it can count fingers held up before the eye; *e.g.*, count fingers at six centimetres. If even this cannot be done, ascertain whether there is perception of light by shielding it or projecting a beam of light from the ophthalmoscope mirror into the eye; *e.g.*, L.P. + or —.

The Board of Education in its suggested schedule of Medical Inspection directs that "if V. (vision) be worse than $\frac{6}{9}$, or if there be signs of eye strain or headache, fuller examination should be made subsequently. Omit vision-testing of children under 6 years of age."

The card of test letters should be strictly to Snellen's dimensions and unglazed. This should be suspended so as to be well illuminated, but not in direct sunlight. It will be found useful to measure off a piece of string to exactly six metres length, and to carry this in the kit-bag along with the test types. It cannot be too strongly insisted that "stepping off" the distance is bound to prejudice the test. A suggestion made by Lowell I have found very useful, viz., to paste across the sheet of test types a strip of green paper half an inch wide immediately under the D. 6 line, and one of red paper under the D. 18 line. They help to save time in indicating the line desired to be read. The card obscuring alternately the child's

eyes should be held by the examiner, not by the child. In no case should the child be allowed to obscure the eye with its hand. If the letters are pointed out by a teacher to facilitate reading and to encourage the child, it should be asked to read all the letters in the line, not merely *one*, which might be correctly deciphered by one astigmatic and who would fail at a differently shaped letter. Directing the lines to be read backwards is often a corrective against learning them by rote from hearing other children. If several are in the room at once to be tested (not desirable) those waiting should face the wall away from the direction of the test till their turn arrives. Examiners should make themselves familiar with the newer methods of "sounding" letters employed in many of the schools. After considerable experience I am satisfied that the employment of so-called "illiterate" charts as a routine practice is disappointing in results and a waste of time. Any illiterate or very young child found squinting, peering, or screwing the eyes up, constantly blinking, or regularly holding objects too near the eyes, should be referred to the clinic for ophthalmoscopic examination. For occasional use for young children a card bearing the series of graduated E's in different positions as first devised by Cohn is the simplest. The child holds a small card upon which an E is printed, and is asked to hold it, so that the limbs are in the same position as the letter indicated on the test by the teacher. Other varieties of this form of test have been suggested, but the letter E is more familiarly recognised by a very young child than the circle with a piece cut out, and other devices such as graduated diagrams of familiar objects are still less reliable. It must be remembered that the tests given for visual acuity only enable us to register this; they do not give any definite information as to the cause of failure or the nature of any defect. These, however, may be considered under three headings—1, Obstructive; 2, Conductive; 3, Perceptive.

1. *Obstructive.*—Opacities in the cornea, aqueous, occlusion of iris, opacity of lens, turbidity of vitreous, are all capable of interfering more or less seriously with vision,

and should be excluded by focussing a beam of light by means of a convex lens of 14 D, and using a second similar lens as a magnifier to examine the cornea, anterior chamber, iris, and surface of lens. If these are all clear and a view of the fundus cannot be obtained with the ophthalmoscope, the vitreous is probably the seat of obstruction.

2. *Conductive.*—There may be a lesion of the nerve elements in either retina, optic nerve, or brain centre.

3. *Perceptive.*—If neither of the above difficulties exists then the visual defect may be due to an error of refraction, or to a defect of accommodation (spasm in children, presbyopia in adults). The fact that a child reads $\frac{6}{6}$ with each eye does not necessarily mean that you are dealing with a case of emmetropia, as a case of low hypermetropia will do the same. The school-room, however, is not the place, nor the ordinary formal medical inspection the time, for attempting to estimate the refraction. Cases registering less than $\frac{6}{9}$ should be referred to the clinic where this is in operation, or in country schools should be left over till the end for further investigation, when reading tests for near vision, and examination by the opthalmoscope may be applied to elucidate the difficulty.

It would be impossible in a short chapter to enter into the details of the ophthalmoscopic methods of investigating visual acuity. Medical students are now expected to attend a short course of ophthalmology, and this, as far as the use of the ophthalmoscope is concerned, seldom does more than make them familiar with the grosser lesions of the fundus associated with systemic disease. It is becoming more essential for school medical officers to have a practical familiarity with the methods of estimating refraction by the shadow test and the direct method. If tuition cannot be obtained at the eye department of some neighbouring hospital, then a reliable text-book will give all directions, and if these are coupled with practice upon an artificial eye such as that devised by Mr. Adams Frost, a diligent worker will readily be able to make himself proficient. As evidence of the growing necessity for such knowledge, the Northumberland County Council has just

arranged for its examining officers to secure the necessary instruction so that they may be able to estimate the refraction of cases in the remoter country districts. Most of the larger text-books have chapters on refraction and its estimation, but the excellent little book by Mr. A. S. Morton, entitled "Refraction of the Eye," will be found complete in itself. That this sphere of useful work is distinctly contemplated by the Board of Education as within the province of the school medical officer is apparent from Circular 596 (N.) with reference to school clinics: "In the case of ocular defects the detailed examination of the child may often be more expeditiously and thoroughly carried out at a school clinic where special appliances are available. So far as a school clinic is used for such purposes, its establishment appears to fall within the scope of provision for medical inspection." School clinics for *treatment* of defects, however, require the special sanction of the Board of Education. It would appear that the simplest form of such clinic would be one for the examination of visual defects and the issuing of prescriptions for appropriate spectacles, or for the actual provision of spectacles supplied from voluntary or municipal funds. At Newcastle-upon-Tyne a system has been in operation for a number of years by which a "Spectacle Fund" provided by subscriptions from the children is administered by the Teachers' Association. Forms are issued to head teachers on application to the secretary at the recommendation of the school medical officer, and when the child presents the form duly filled in along with a prescription, the optician supplies the spectacles free. Over eighty pairs were so supplied last year. In some cases the parent pays a penny or more a week to the teacher, who returns the money to the secretary of the fund; generally, however, the spectacles are, after inquiry, given free to the really necessitous. In the Bradford Clinic spectacles costing from 1s. 5d. to 2s. 6d. are provided by the Education Committee, and where possible the cost recovered from the parent. In London a voluntary association provides them at prices ranging from 1s. 9d. to 4s. 6d. There is no doubt that

exorbitant charges, under the pretence of quasi-professional advice, are made by many advertising opticians, and any system which would not only cheapen the cost of spectacles to the poor, but would enable the working classes to pay for them by weekly instalments, would be a great boon.

Equipment of Eye Clinic.

A clinic such as has been suggested for purely refraction work would require the following for its equipment: A room, preferably over six metres long (over twenty feet), otherwise the distance letter tests will have to be carried out by reflection in a mirror, a reversed letter chart being fixed behind and above the patient's head. Test types (Snellen's for distance and for near vision), an E chart, Pray's astigmatic letter chart, astigmatism fan chart, army dot test card, Holmgren's wools or Jeaffreson's colour circle, an ophthalmoscope (Morton's recommended), a case of trial lenses, and an adjustable trial frame which will give all the measurements required for the correct fitting of a spectacle frame. The case of trial lenses should be a really good one, and will contain an assortment of blank, pinhole, stenopaic discs, etc., as well as prisms and discs of red and green glass, Maddox rod, groove, etc., for the testing of diplopia, paralysis, or insufficiency of the external eye muscles. A table lamp, electric or gas, adjustable for heights, will be found even more useful than the usual fixed wall bracket, as it can be placed where desired. It should be fitted with an opaque chimney with an aperture controlled by an iris diaphragm. The lamp can be placed on a small table at the side of the chair on which the patient sits, and the chair, preferably adjustable, should have a head-rest to steady the patient. An adjustable stool will be required for the examiner. The room should be darkened by roller blinds of opaque material, or shutters, and to prevent troublesome reflections a screen, threefold and painted a flatted black, can be placed to enclose the table lamp, examination chair, and the examiner, so that the chair and stool would occupy the position of the middle limb of a capital E. A great deal of time can be

saved and work expedited by the use of the ophthalmometer (Javal-Schiotz, Meyrowitz model). The amount of corneal astigmatism, its direction, and the axis of the cylinder needed to correct it, can be determined objectively in a few seconds. If this appliance were more commonly used to confirm the results of skiascopy we should see much less often than we do prescriptions for the same patient with widely varying axes marked by different examiners. The Geneva lens measure, a small instrument about the size of an ordinary watch, will be found very useful in determining the character of the spectacle lenses being worn by a patient who comes for examination. It will automatically define the nature and amount of the concavity or convexity of a lens surface, as well as the axis, if it be a cylinder, and saves the time otherwise taken up by neutralising with lenses selected from the trial case. A selection of ophthalmic tabloids (atropine, homatropine and cocaine, cocaine, eserine) will be found much more stable than solutions and the dosage more accurate. For regular refraction work it will be found much cheaper to use a solution of homatropine and cocaine (2 per cent. of each alkaloid) in pure castor oil, and to use this with a dropper. One drop is instilled into each eye, and at the end of half an hour a second drop. In another half an hour most cases will be ready for examination. Refraction cases should be seen at special times in the week, as the investigation takes some time to complete. As will be noted, one hour is taken to effectively suspend the accommodation, so that if from 9 to 12 is devoted to this work only two hours are left for actual refraction work, about twelve to eighteen cases.[1]

For the use of country officers an ophthalmoscope with electric lamp attached and actuated by a small dry cell battery can be obtained, which will be found extremely useful. The case of trial lenses can also be supplied in a compact and portable form. Country examiners, too, are

[1] The total cost of the apparatus enumerated would be about £45, and details of prices, etc., can be obtained from Messrs. Prentice and Bull, 6, Great Portland Street, London, W., or other responsible opticians.

constantly confronted by the difficulty children find in securing spectacles when far away from market towns or the large centres of trade. To meet this I think it will become necessary for the examiner to either take the measurements and pass them on to the optician, or himself to carry a selection of frames and lenses. In America most oculists are also their own opticians, and the combination would not appear to be any more derogatory professionally than the provision of physic or a pessary. Spectacle frames suitable for children with curl cable sides can be obtained with eye holes to a standard size, and a selection of lenses to the same size is also supplied of assorted strengths which can be screwed up in the frames in a few seconds. The variation of frame as regards level of pupils, centres of pupils, width of face, and shape of nose-bridge are not very great; they can be reduced for nose shape to about three patterns, so that the selection of frames carried need not be large or may even be kept at headquarters. Convex or concave lenses of all strengths can be stocked, but cylinders would have to be ground expressly, a matter of a few days' interval. The cost of spectacles and lenses under this system would run: frame, 1s. to 2s. 6d., according to quality; and lenses, 8d. to 2s. per pair, according to complexity. The facility with which minor repairs can be executed is a great advantage, as all parts are interchangeable and to standard. A broken lens, side, or missing screw can be replaced at once.[1]

A school clinic opened in the simple way above detailed might readily be developed later so as to enable it to cover the treatment of external eye diseases and the other simple conditions set forth in Circular 596.

External Eye Diseases.

In contrast with the wide divergence of reports as to the extent of defective vision, the question of external eye diseases is one which lends itself to a readier recognition, as differences of method and opinion enter less into the judgment formed. From Dr. Newman's report we learn

[1] Messrs. Prentice and Bull will furnish details of cost, etc.

that "external eye disease takes the form most commonly of blepharitis, conjunctivitis, and inflammatory conditions of the cornea. . . . Approximately 3 per cent. of the children throughout the country suffer from one or another of these conditions, the number in the rural areas does not seem materially less than those in the towns and urban districts."

The early recognition of these conditions, especially by the teacher, is very necessary, both on account of the risk of contagion and the necessity for proper treatment. As an evidence of this I may quote the following from a report to my committee in June, 1904: "It has frequently happened at my casual visits to departments that I have excluded cases which, if left to spread infection to others, would very shortly have resulted in a considerable diminution of school attendance, to say nothing of the physical risk incurred by those infected. This is particularly true of cases of ophthalmia. For example, on inspecting a junior class, one child is noticed with a handkerchief over her eye, and is stated by the teacher to have had a knock. On examination it is found to be a case of infectious eye inflammation, running profusely with matter, and that two sisters, one at home and the other in a higher department, are both suffering from the same condition.

ROYAL JUBILEE SENIOR.—COUNCIL SCHOOL.—TOTAL ABSENCES FROM OPHTHALMIA.

	Jan.			Feb.			Mar.			
Date...	15	22	29	12	19	26	5	11	18	25
Absences	0	2	3	3	3	5	5	6	4	6

	Apr.			May				June		
Date ...	15	22	29	6	13	20	27	3	10	17
Absences	5	7	8	18	18	14	17	14	17	18

The study of such statistics shows how steadily infectious conditions will increase, even in spite of careful inspection and elimination."

In October, 1901, a Circular was issued by the Board of Education calling the attention of managers and teachers of elementary schools to conditions injuriously affecting the eyes and eyesight of scholars. After referring to errors of refraction the Circular goes on to mention: "(*b*) Various forms of disease, such as contagious or non-contagious ophthalmia, eczema affecting the lids, inflammation of the follicles of the eyelashes, pimples or pustules upon the eye surfaces, or inflammation or ulceration of the cornea. Many of these forms of disease are inconspicuous in their origin and might easily escape notice unless special attention were paid to the possibility of their occurrence. Some of them are highly contagious, and might become of serious import to the school as a whole, as well as to the original sufferers. . . . It should be the duty of teachers to observe any appearance of unnatural redness or soreness of the eyes, or any tendency on the part of the child to be often rubbing them when at work. . . . Two especially common forms of disease are the contagious ophthalmia chiefly affecting the insides of the eyelids and the contagious ophthalmia affecting the lid margins, and tending to destroy the eyelashes at their roots. Both of these are liable to be aggravated by insanitary home conditions, and both are contagious from child to child either directly, by finger contact, or through the medium of slates, towels, sponges, needlework, and so forth. . . . Managers and teachers, especially in poor districts, are therefore recommended to be watchful with regard to this matter, to exclude any child that is affected and to take care that he shall not be re-admitted without a medical certificate of fitness." (G. W. Kekewich.)

In Eulenberg's Real Encyclopædia der Heilikunde, p. 602, will be found a table prepared by Cohn from particulars of 300,000 cases, and showing the incidence of various forms of eye disease as follows—those of the

Conjunctiva	amounted to	30	per cent.
Cornea	„	21	„
Refraction	„	12	„

Eyelids	amounted to	9 per cent.
Iris	„	6 „

Mr. N. Bishop Harman[1] has analysed his experiences of similar conditions affecting a very large number of London school children, and diseases were found to exist in the following proportions:—

Blepharitis	74.0 per cent.
Phlyctenulae	15.0 „
Conjunctivitis	10.5 „
Congenital anomalies	4.0 „
Eyes lost	2.0 „
Interstitial keratitis	1.5 „
Effects of ophthalmia neonatorum	1.5 „

Blepharitis.

Mr. Harman draws particular attention to what has often been noted before in other terms, that blepharitis is a dirt disease. One constantly finds it associated with foul, sore heads, resulting from vermin; sometimes nits may actually be found on the eyelashes. The transference of septic material by the finger-nails and fingers, from sores, and especially from nasal sores, impetiginous scabs, and nasal discharges, is undoubtedly the cause of a good deal of the blepharitis and conjunctivitis met with. It is essential to aim first at complete cleanliness in the treatment of these cases of blepharitis. All scabs should be removed from the lids after bathing with a warm alkaline lotion (sod. carb., grs. 5 to water 1 oz.), and the eyelashes cut off. The child's finger-nails should be cut short and cleansed often. Rhinitis, nasal discharge, and scalp sores should be concurrently vigorously treated. For the squamous variety of blepharitis, after the scabs have been cleared away, the edges of the lids should be dressed with an ointment of sulphur and resorcin, each 2 per cent., but the ulcerative form will be found to give way better to a mild cauterising with silver nitrate (grs. 20 to 1 oz. water,

[1] *Public Health*, May, 1909.

painted on), the Ung. Hydrarg. Nit dil., or to a lotion of copper, zinc, and alum sulphates of each 1 gr. to water 1 oz. The simpler forms of blepharitis readily yield to cleanliness and the regular use of an ointment containing grs. 4 of the yellow oxide of mercury to the ounce of soft paraffin or lanoline, applied twice a day. There is no doubt that many incipient cases would be prevented from becoming chronic and chronic cases cured if they could be dealt with at the clinic every day and personally dressed by the school doctor or nurse. Much of the material so generously distributed at out-patient departments is absolutely wasted. Lotions for conjunctivitis never get inside the lids if they are ever used at all. They should be prescribed as *drops* rather than lotions. But the helplessness, ignorance, and often the absolute carelessness as to the condition of the children displayed by many of the parents are appalling to those constantly in contact with them.

Uncorrected errors of refraction, especially hypermetropia and hypermetropic astigmatism, may induce and keep up hyperæmia of the lids, recurrent styes, conjunctival injection, and even mild keratitis, as well as cause spasm of the lids. But the ordinary forms of blepharitis met with in school—scaly, crusting, ulcerating, often suppurating—are undoubtedly parasitic in origin.

Conjunctivitis.

Modern advances in bacteriology and pathology have revolutionised the older views as to the causation of the various forms of conjunctivitis, and have brought a great change in methods of diagnosis and treatment. The commoner cases of acute conjunctivitis are associated with one or other of three readily recognisable forms of micro-organism:—

1. The Koch-Weeks bacillus.
2. The Morax-Axenfeld diplobacillus.
3. Various cocci, the gonococcus, the pneumococcus of Fraenkel, staphylococci, streptococci.

In addition to these, but comparatively rarely met with, are the Klebs-Loeffler bacillus (diphtheritic, membranous conjunctivitis) and the tubercle bacillus (tuberculous conjunctivitis). Of the three groups first mentioned, from the point of view of the terrible devastation it causes, the gonococcus, so generally associated with ophthalmia neontorum and infantile blindness, as well as with the gonorrhœal conjunctivitis of adults, is perhaps the most important, although its presence in the schools is strangely infrequent compared with the prevalence of gleet in the homes. The organism most commonly met with is the Koch-Weeks bacillus producing acute catarrhal, muco-purulent conjunctivitis, or blight. The diplobacilliary conjunctivitis is generally of a sub-acute type, and of the "angular" variety, whilst the pneumococcal is more common in America than in this country, and save for the difference in the associated organism is almost indistinguishable from a mild form of blight.

Staphylococci and streptococci associated with ordinary forms of suppuration, by transfer of septic material will inoculate the conjunctival sac and produce a more or less virulent form of conjunctivitis. I have found this concurrently with an otitis media, and in cases of rhinitis, nasal discharge, etc., the ready method of transference being by finger or handkerchief. Impetigo of the face, scalp, etc., and pustular eruptions will be found to co-exist, and as impetigo contagiosa has been definitely proved to be due to staphylococci, the inference is obvious. Conjunctivitis of the phlyctenular type will often be found associated with rhinitis. Indeed, the examination of the nasal cavity and accessory sinuses is of great importance in eye conditions. Post-nasal obstruction will often quickly develop a basal-pressure interference with vision, and neuritis which can only be cleared by immediate operation. Sudden diminution of visual acuity, without any evident error of refraction, and with double optic neuritis, will often be found due to adenoids or post-nasal infection.

The school doctor should be familiar with the methods of detecting the various organisms mentioned by the microscopical examination of stained cover-glass films.

This is comparatively easy, since the process can be carried out expeditiously without the necessity of incubating as is essential in the examination of most other forms of bacterial life. For accurate and simple instruction in the methods of recognising the various micro-organisms associated with conjunctivitis the reader is referred to the excellent little book by Mr. Sydney Stephenson, "Contagious Ophthalmia," to "Bacterial Diseases of the Conjunctiva" (Evans), and to "Modern Laboratory Methods" (French). That there is a great difference in the geographical incidence of various forms of coccal and bacillary conjunctivitis is evident from the following table prepared by Scholtz and Vermes (Klin. Monatsbl. f. Augenh., July, 1909):—

Place.	Author.	Diplo-bacilli.	Koch-Weeks Bacilli.	Pneu-mococci	Gono-cocci.	Other Exci-tants.	Staphy-lococci Xeros-is b. or none.
Freiburg	Axenfeld ...	57.6	4.5	3.7	1.3	1.7	30.9
Lausanne	Gonin ...	50.8	5.2	3.0	7.6	5.7	27.6
Budapest	Scholtz and Vermes	45.4	15.2	4.6	1.8	1.4	31.6
Paris ...	Morax ...	37.2	25.2	2.6	17.4	2.6	14.7
Marburg ...	Zia ...	36.4		28.4		10.7	26.1
Copenhagen	Lundsgaard	35.5	2.8	14.0	4.6	1.9	41.1
Würzburg ...	Bach and Neumann	31.8	0.9	13.6			53.6
Glasgow ...	Pollock ...	17.9	54.6	3.4	6.0	0.8	17.0

It is evident that the Koch-Weeks bacillus is most commonly associated with acute conjunctivitis in this country. It is important to be able to differentiate these organisms, too, on account of the treatment necessarily varying with each form found. Gonococcal infections require, in addition to douching, the use of silver salts—*e.g.*, protargol, or argyrol, 5 to 15 grs. to the ounce of water, or even the powder dusted in; nitrate of silver, 1 to 2 grs. to the ounce. Diplobacillary conjunctivitis is best treated by means of zinc sulphate, gr. 1 to the ounce of water, or by an ointment suggested by Peters containing

ichthyol 0.15, zinci oxid 5.0, and white vaseline 15.0. If the zinc sulphate is not tolerated, a new salt of sulphatic acid termed by the makers Nizin and used gr. 1 to water 1 oz. will be found perhaps less energetic but free from much of the smarting caused by the sulphate. For cases of blight, douching the eye frequently with a simple warm boracic lotion, the instillation of weak hydrarg. perchlor., drops $\frac{1}{60}$, and touching the lid edges with white vaseline at bedtime will be found effective. The exanthemata, especially measles, are often the source from which a subsequent debility and anæmia leave the conjunctivæ and lids free for the less resisted development of bacteria. Shottelius examined eighty cases of conjunctivitis occurring during the course of measles, and in a large percentage found staphylococci and streptococci present, the latter being especially common in the fatal cases. An outbreak of measles in an orphanage or similar institution will, if a case of trachoma happens to be present and undetected, lead to an almost wildfire-like spread of serious conjunctivitis, as happened in a large boarding school I was asked to report upon quite recently. Teachers should be instructed in the ready recognition of cases of conjunctivitis and should send any suspicious cases to the clinic for directions as soon as it is noticed in school. A foreign body in the eye will cause great pain and simulate a commencing conjunctivitis, and teachers readily learn how to look for such and to evert the upper eyelid if instructed by the doctor at his visits to schools.

Should an outbreak of acute conjunctivitis occur, frequent visits should be paid to the school, and suspicious cases quickly eliminated. The use of towels and lavatory basins should be temporarily suspended, and no case readmitted without a certificate from the clinic. When certifying cases for admission to industrial or other schools it is very necessary to carefully exclude any cases of acute or chronic conjunctivitis. The more serious form of the latter—although it is of course met with in the acute form, trachoma—fortunately occurs but sparsely in this country. In its early stages it is undoubtedly difficult to differentiate

and will be till further certainty is arrived at as to the specific organism underlying it; but in its later phases the presence of the aptly described "sago grains," small, round, greyish-white granulations like minute papillæ on the under-surface of the lids are unmistakable. There is often profuse, purulent discharge, and the condition is so acutely contagious and so chronic in its career that segregation of a more or less permanent character in a special school or institution is the only satisfactory method of preventing the spreading of infection. Special care should be taken in all boarding schools to have modern lavatory arrangements, continuous washing flow if possible, separate towels hung well apart, separate face cloths, nail brushes, etc.

Keratitis.

The cornea in children is frequently the seat of ulceration, often phlyctenular and associated with conjunctivitis of a similar type. The ulceration on healing is, unfortunately, liable to be accompanied by the deposition of connective tissue in the eroded area which is more (leucoma) or less (nebula) opaque, and producing the whitish patches so often found, and which may seriously obstruct vision. The sequelæ of keratitis in one form or another are responsible for nearly 10 per cent. of the blindness in schools for the blind, hence its early and successful treatment is of the greatest importance. Corneal ulceration is the common consequence of bad hygienic surroundings, malnutrition, and the anæmia and debility following the exanthemata and requires systemic as well as local treatment. For the latter it is often quickly cured by the dusting in of powdered calomel or the use of yellow oxide of mercury ointment. If spreading or purulent, the use of cocaine and then the electric or actual cautery, or pure carbolic acid applied on the end of a minute swab will be found effective.

Keratitis of a deeper character will often be met with—the interstitial variety due to hereditary specific disease, and generally displaying collateral evidence in the presence

of the characteristic physiognomy, Hutchinson's teeth, etc. Punctate keratitis, so called from the minute dots of deposit seen on the posterior surface of the cornea, is really an evidence of plastic uveitis. The iris and uveal tract are involved, and particles of broken-down cells stream through into the aqueous and are deposited upon Descemet's membrane in a triangular patch, base downwards. Indeed, it is very probable that interstitial keratitis is similarly an extension to the cornea of an inflammatory process commencing in the uvea. Treatment of the interstitial form of keratitis consists in keeping the iris under atropine, and the system under mercury either externally by rubbing in mercurial ointment or internally by small and continued doses of hydrarg. c. creta. Most of the other types of corneal break-down are associated with anæmia or the tuberculous diathesis. Calmette's reaction has been frequently used with success to show the latter, and experience shows that no amount of local treatment alone is sufficient for their satisfactory treatment. Abundant open-air exercise, milk, fruit, a large amount of fatty foods are essential as well as the routine tonics.

Points for Teachers.

Teachers may do much to safeguard the health of the children under their care, and in the matter of eyesight they have frequent opportunities of effectively co-operating with the school medical officer. At his visits or in lectures he should impress upon teachers the importance of the following points: (1) To secure a suitable size of desk and a correct reading posture for children; the eyes not to be nearer to the book than twelve inches. If the child habitually shortens this distance, or can only read or sew at arm's-length, it should be referred for advice. (2) Good lighting, from the left. The darkest corner of the room is that to judge by. (3) Clean (*i.e.*, black) blackboards, large writing, and diagrams. (4) To refer at once for advice all children unable to bear a good light, squinting, those holding the head sideways in reading, screwing the eyes up or wrinkling the forehead in the effort to see, or those who

complain of headache at work, sewing, etc., or who have easily reddened or watering eyes, or who say that the print or sewing becomes blurred after a while, or that they cannot see the blackboard, etc., from the back benches. Not to be content with simply giving them a front seat, but to make sure that they get medical advice. (5) To exclude at once all cases of sore or inflamed eyes or eyelids, especially if running with humour or matter, and not to readmit without a certificate of fitness. (6) To see that children wearing glasses keep them clean and that they fit correctly. (7) To make sure that a child often making mistakes in copying, or an apparently dull child, is not so because of defective sight or hearing. (8) To make themselves familiar with the process of testing sight by means of the test types and to test every suspicious case without waiting for the visit of the school doctor. (9) First aid in eye accidents, removal of foreign bodies; to avoid being themselves a source of danger to the eyes of pupils—*i.e.*, not to go round a class correcting with a penholder behind the ear, or with a stick, pointer, strap, or cane in the hand. I have seen accidental injuries to pupils' eyes from all these objects carried by teachers.

The Eyesight of "Leavers."

When examining those about to leave school it is important in cases of defective vision to inquire what occupation in life the parent intends them to aim at. Often in railway or shipping centres, military or naval depôts, these are the forms of service many intend to enter, and as eye tests for form and colour are insisted upon for railway clerks as well as drivers, signalmen, for army and navy, and for sea-going engineers, etc., it is desirable that the school medical officer should make himself familiar with the various standards required. Inquiry from the local railway company will secure copies of the regulations, whilst those for army, navy, and mercantile marine can be obtained from the War Office, Admiralty, or Board of Trade. Some of these regulations will be found as an appendix to the excellent little text book of Mr. Jessop.

For army testing a card with dots to the scale for distance of the bull's eye on targets is used, and it is well to familiarise a boy with the counting of these at the required distance.

For colour testing care should be taken to discriminate between colour ignorance and colour blindness. I have always found the "Colour Circle" devised by my predecessor, the late Dr. C. S. Jeaffreson, the most useful and expeditious appliance for colour testing work, as by its means a correct record can be kept of the defect found and exact mistakes made. All the colours are numbered, and the result, as in Snellen's tests, may be expressed as a fraction. The numerator designates the test-colour, the denominators the colours selected by the candidate, *e.g.*,

$$\frac{\text{30 (Pale Green.)}}{\text{30, 33, 34 (all correct hues.)}}, \text{ or } \frac{\text{30 (Pale Green.)}}{\text{4, 7, 20, 31 (Nos. of colours selected.)}}.$$

In the latter case only one colour selected (31) was correct, the rest betray defective chromatic sense. The instrument can be used rapidly and the colours are protected from becoming soiled as they are not handled.

As a sample of railway clerkship regulations we may take the following, which applies to the North Eastern Railway:—

"Clerkships.—Age of candidates, 13-17. If the Company's medical inspector reports that the candidate is colour blind, his form vision in either eye is worse than $\frac{6}{12}$ Snellen, . . . he will not be accepted. If his form vision is below normal $\frac{6}{6}$ in either eye, but not worse than $\frac{6}{12}$ in either eye, and he can obtain glasses which will give normal vision, the general manager will consider whether the circumstances justify his being accepted. . . . Accepted candidates with eyesight below $\frac{6}{6}$ Snellen will not be eligible for promotion to such posts as station-master, inspector, or other grade where normal vision is necessary."

It is easy to see from these and other similar regulations how abnormalities of vision handicap boys in the struggle of life. Several trade unions will not admit members wearing spectacles, whilst it is notorious that failure to use appropriate glasses, for presbyopia especially, is the cause of

many a spoilt job and much wasted material—to say nothing of accidents.

One is often asked whether a certain eye defect will prevent a candidate from entering the teaching or other profession.

The Board of Education, in a letter to the writer, defined the conditions thus:—"It is not necessary that the eyesight of a candidate (pupil teacher) should be perfect in order to enable him to satisfy the Board as to his physical capacity in the manner prescribed by the Elementary School Teachers' Superannuation Rules, 1899. It is only required that the candidate

1 Must be able to teach a class sufficiently with the aid of glasses.

2 Must not be in danger of losing his sight. (13 June, 1905.)"

Two medical report forms are used in connection with the teaching profession—one 42A. D.A.F., for candidates desiring recognition as certificated teachers, and in it as bearing upon eyesight we may note query "2 Is the candidate free from physical defect, deformity, and disfigurement?" (Evidently strabismus, unless *very* slight or remedied surgically would disqualify; similarly ptosis, artificial eye, etc.)

"3 Is there any such defect in sight . . . . as to interfere with efficiency as a teacher?"

The examiner is also requested to designate the candidate as falling within one of five grades of fitness. The second form, 4 T.C., deals with candidates for entrance to a training college, and in this the examiner is directed to allocate the applicant to one of three classes as to physical condition:—

A. Practically first-class lives, free from any physical defect.

B. Below normal, *or* . . . . having such defect of sight . . . as does not at present materially interfere with efficiency as a teacher, and is not likely to do so in the future. . . .

C. Wholly unfit.

It will be seen, therefore, that the regulations of the Board are far from stringent in the matter of eyesight, and the practical judgment of the examiner is held to be a sufficient guarantee of fitness. In brief, then, candidates should be free from eye disease and capable, with glasses if need be, of satisfactorily performing the duties of a teacher as regards supervision of class, etc.

The question of what amount of myopia should guide one in recommending the parents of a boy or girl not to select for them any occupation involving prolonged study or continuous close work (dressmaking, etc.) is not always an easy one to decide without a full summing up of the general physique. One would hesitate, however, to recommend a myope of 4 or more than 4 D and progressing in each eye, and aged 13 to enter either class of life work. High hypermetropes are equally unsuited.

Eyesight of the Mentally Defective.

It will often be found that mental defect along with other developmental anomalies, the "stigmata of degeneration," is associated with narrow or oblique palpebral fissures, epicanthus, microphthalmos, coloboma of the iris, congenital cataract, absence of choroidal pigment (Albinism), nystagmus, strabismus, astigmatism, etc., some of which conditions can be alleviated by suitable spectacles. Albinos generally suffer from myopia or myopic astigmatism as well as nystagmus, and their spectacles should be tinted a medium blue to make light more easily tolerable. Nystagmus is commonly associated with cases which have suffered from ophthalmia neonatorum or other inflammatory affections which have left the cornea more or less obstructed by deposits of connective tissue. The ordinary nystagmus consists of a series of short, rapid, regular oscillations of the eyeballs about a central point, in a horizontal, vertical, or rotary direction, and is rarely unilateral. A form of globe tremor, pseudo-nystagmus, is found in cases of hereditary ataxia (Freidreich's disease). In this the oscillations only occur when the action of the external eye muscles in any given direction has reached its maximum—*e.g.*, on reaching the limit of a movement to

the right the eyes will move steadily till the limit of excursion is reached and then move still further with tremors or jerks and back again. When the eyes are fixed upon some central point, or at rest, they are usually quite still, whereas in the ordinary forms of nystagmus the movements are unceasing.

Letter-blindness and word-blindness, as well as a failure to recognise numbers (numeral-blindness), will also be found. A boy came under my notice recently who appeared to read his primer correctly in school, continuing where his neighbour left off, but when asked to spell or begin without any words being sounded as a cue, was unable to do so or to recognise letters. He could repeat many pieces by heart, evidencing a good sound-memory, but his visual centre for letters was undeveloped. Further cases of a similar character are detailed by Dr. J. Hinshelwood in his little book "Letter-, Word-, and Mind-blindness" (Lewis and Co.). Mirror-writing or visual reversal, so that what a child writes or copies can be correctly deciphered in a mirror placed alongside, is another curious abnormality met with among defectives, sometimes only occurring at intervals, and somewhat akin to the reverse spelling one meets with when a child asked to write d-o-g will write or spell g-o-d. It is most essential to carefully examine into the eye condition of all mentally defectives as well as into their hearing capacity. Frequently children are put forward for examination as mentally defective who are merely dull and defective in one or other sense-organ. The training of the external eye muscles is a point often overlooked in the education of the mentally defective. Independent movement of the eyeballs with the head still, following some glittering object moved to and fro, should be frequently practised so as to extend the lateral range of vision.

Blindness in Children.

The Elementary Education (Blind and Deaf Children) Act, 1893, directs that all blind children between the ages of 5 and 16 shall attend a certified school for the blind.

The term "Blindness," however, has not yet been satisfactorily defined. It has been suggested that all cases registering $\frac{1}{60}$ Snellen or worse should come under this classification. For educational purposes a child is considered blind or of sufficiently defective sight to justify its being received into a school for the blind if its vision will not allow ordinary school books to be read. Section 15 of the Act defines the term "Blind" as meaning "too blind to be able to read the ordinary school books used by children." As a rule children are sent far too late for blind school education. It is most important for them, as for the deaf also, to be drafted off for special instruction and training as soon as it is evident that the child's condition falls within the definition given. By staying at home a blind child, especially among the poorer classes, is apt to develop slovenly, repellent habits, the eradication of which after its admission to an institution is often a matter of difficulty. The sedentary, moping, torpid state encouraged at home is reflected in a sluggish brain development. Whilst the medical officer's duty is quite plain in most instances of blindness, cases come before him now and again in which it becomes more a matter of prudence than of immediate necessity to recommend blind training when vision is very defective and the prognosis as to sight bad or doubtful. Such cases, though it is more difficult for them to acquire tactile sensibility and deftness, often prove efficient teachers of the blind. It is a matter of importance too that the industrial training of blind pupils should be linked up continuously with agencies providing workshops, etc., so as to secure the means of earning a livelihood. It is often a disappointment to find that a failure in this direction produces merely the musical loafer or street beggar instead of the self-supporting workman.

Prevention of Blindness.

Many years ago it was stated by Cohn that of all cases of blindness 40 per cent. were preventable. Later experience has proved this statement to be under rather than over the mark, and the statistics of our blind schools abundantly

substantiate it. In the Royal Victoria School for the Blind, Newcastle-upon-Tyne, to which I have been ophthalmic surgeon for some years, the annual statement I have compiled of the causes of blindness among the pupils shows the average percentage due to ophthalmia neonatorum to be 36.8—*i.e.*, *more than one-third of all the inmates*—and forms of keratitis to be responsible for about 10 per cent.

In the year 1903 the percentage of blindness due to ophthalmia neonatorum was 36.6; 1904, 39.1; 1905, 37.1; 1906, 35.8; 1907, 26.4; 1908, 31.6; 1909, 41.1.

The experience of other observers in other places confirms this. Mr. N. Bishop Harman gives the result of his inquiries in the blind schools of London as 36.3 per cent. due to ophthalmia neonatorum, and 9 per cent. to disease of the cornea, chiefly specific. On the Continent the percentage of infantile ophthalmia at the time investigations were made by Fuchs ("Causes and Prevention of Blindness," p. 120) was even higher:—

Observer.	Place.	Per cent.
Reinhard	Germany-Austria Denmark-Holland	40
Claisse	Paris	46
Magnus	Breslau	34
Kartz	Berlin	41

an average of 40.2 per cent. of the pupils in blind asylums.

These estimates, of course, only include cases occurring among young people, amongst whom the incidence of diseases peculiar to childhood is more common, but, after making due allowance, I think it may be fairly stated that fully 30 per cent. of all blindness is the result of a disease, due to contamination from a micro-organism, occurring in early infancy and *preventable* by knowledge, care, and simple cleanliness. Dr. Newman, in his first annual report, gives the number of children in the blind schools of England and Wales as 1,608, and if we take 36 per cent.

of this we find that no less than 580 children in this area have been allowed to become blind through the omission of simple precautions. It is appalling that this terrible neglect should be allowed to go on from year to year, a standing mockery of the advance of science of which we otherwise justly, but perhaps vaingloriously, boast. It is the one dark spot upon the escutcheon of modern medicine. The American is nothing if not businesslike, and estimating the average daily wage of an able-bodied man at one dollar, the total national loss in America works out at the huge sum of seven and a half million dollars annually for this form of preventable blindness alone. Dr. Grossman, in 1899, similarly estimated the loss to the United Kingdom as half a million pounds. Take even the expense of the education of the 580 children so blind in England and Wales. Omitting receipts from Government grants, and the donations of the charitable, it must cost well over fifty thousand pounds per annum. I believe that in the elementary schools of the country school medical officers have a magnificent opportunity of carrying on an educational work on the subject of ophthalmia neonatorum and its prevention that would soon be reflected in a diminution of this terrible scourge. I would therefore strongly urge every officer to give particular study to this subject, and to take steps to have information upon it embodied in all schemes of domestic economy, hygiene, etc., taught in the schools. These should, if possible, be accompanied by a distribution to the "leaving" girls of the warning notice which has been found so useful in many districts, viz.:—

HOW TO PREVENT BLINDNESS.

Take care immediately a baby is born, before anything else is done, to carefully wipe the eyelids and parts round the eyes with a soft, dry, clean rag, or cotton wool, and then to wash these parts with luke-warm water.

IMPORTANT.

If a baby's eyes look red and swollen, or run with matter a few days' after birth TAKE IT AT ONCE TO A DOCTOR.

The Disease is very dangerous and if not treated at once may destroy the sight of both eyes.

The writer has been fully conscious of the impossibility of condensing a treatise on ophthalmology into the few pages at his disposal, and perforce reference to many topics has had to be omitted. He has endeavoured to touch, perhaps somewhat discursively, upon several phases of eye work as they have appealed to him during some years of work as a school medical officer. Of all points, the prevention of early blindness is the one he would like most to emphasise as being a work especially capable of being propagated through the agency of the elementary schools of the country, and one bearing in its train the inestimable blessing of protection against the curse of blindness falling upon the innocent and helpless of our race.

REFERENCES.

ABNEY, SIR W. DE W.: "Colour Vision." London: Sampson Low, 1895. 12s. 6d.

BUXTON, A. ST. CLAIR: "Vision: Errors of Refraction and Accommodation," in "Medical Annual." London: Simpkin, 1902. 7s. 6d. net.

COHN: "Hygiene of the Eye in Schools." London: Simpkin, Marshall, 1886. 10s. 6d.

EVANS, JAMESON: "Bacterial Diseases of the Conjunctiva," in *Ophthalmoscope*, April, 1904.

FRENCH, H.: "Medical Laboratory Methods." London: Bailliere, Tindall and Cox, 1907. 5s. net.

FUCHS, E.: "Causes and the Prevention of Blindness." London: Bailliere, Tindall and Cox, 1885. 7s. 6d.

FUCHS, E.: "Text-book of Ophthalmology." London: Lewis, 1899. 25s.

HAAB: "Atlas and Epitome of Ophthalmoscopy, and Ophthalmoscopic Diagnosis." 3rd edition. London: Saunders, 1901. 13s.

HAAB: "Atlas of External Diseases of the Eye." 2nd edition. London: Saunders, 1903. 13s. net.

HARMAN, N. BISHOP: "Preventable Blindness." London: Bailliere, Tindall and Cox, 1907. 2s. 6d. net.

HARMAN, N. BISHOP: "Conjunctiva in Health and Disease." London: Bailliere, Tindall and Cox, 1905. 10s. 6d. net.

HINSHELWOOD: "Letter-, Word-, and Mind-blindness." London: Lewis, 1900. 3s.

JAVAL: "The Blind Man's World." London: Pulman, 1904. 3s. net.

JESSOP, W. H. H.: "Ophthalmic Surgery and Medicine." London: Churchill, 1898. 9s. 6d.

LANG, W.: "Methodical Examination of the Eye." London: Longmans, Green and Co., 1895. 3s. 6d.

MORTON: "Refraction of the Eye." London: Lewis, 1906. 3s. 6d.

POSEY, W. C., AND SPILLER, W. G.: "The Eye and Nervous System." London: Lippincott, 1906. 25s. net.

RISLEY, W. F.: "School Hygiene," in "System of Diseases of the Eye," vol. ii., by C. A. Norris and — Oliver. London: Lippincott, 1897-99. 21s. net each vol.

SNELL: "Eyesight and School Life." Bristol: Wright, 1895. 2s. 6d.

STEPHENSON, SYDNEY: "Epidemic Ophthalmia." Edinburgh: Young J. Pentland, 1895. 9s. net.

STEPHENSON, SYDNEY: "Contagious Ophthalmia." London: Bailliere, Tindall and Cox, 1900. 2s. 6d. net.

STEPHENSON: "Ophthalmia Neonatorum." London: Pulman, 1907. 12s. 6d. net.

TSCHERNING: "Physiologic Optics." Philadelphia, U.S.A.: Keystone Co. 10s. 6d.

Among official documents the following should be consulted:—

Annual Reports of Medical Officer to School Board and County Council for London (Westminster: P. S. King and Son): 1903, pp.14-19, Procedure, Results, etc., Examination of 20,000 Children; 1904, pp. 27-29, Further Results, Relation of School Conditions to Defective Vision; 1905, p. 31 *sq.*, Résumé of Previous Results, Conjunctivitis, Trachoma; 1906, p. 37, Spectacles, Necessity for Simplicity of; 1907, pp. 51-58, Results of Vision Testing: Artificial Lighting of School-rooms,

special article by N. Bishop Harman; 1908, 2s., pp. 28-31, "Needlework and Eyesight," special article by Dr. Louisa Woodcock, and pp. 54-59, "Results of Vision Testing and Special Analysis of Refractions at Hospitals," special article by N. B. Harman.

Report of the Committee on Colour Vision. [Cd. 6688.] London: Wyman, 1892. 9d.

See also: "Transactions of Second International Congress on School Hygiene." London: Royal Sanitary Institute, 3 vols., 12s. 6d.; vol. I., p. 51-95, "Lighting of Schoolrooms," Papers and discussion; vol. II., p. 711, "Trachoma in London Schools," Treatment, by Tyrrell; p. 553, "Trachoma in American Schools," by Cronin; p. 794, "Mental Characteristics associated with Blindness," by Harman; p. 820, "Definition of Blindness in Children," by Bronner, and discussion.

Consult: "Transactions of the Ophthalmological Society": "Eyesight in School Children," by W. T. Jackman, p. 327, 1887; "Periodical Testing of Eyesight in Schools," by Priestly Smith, p. 220, 1894; "The Eyesight of Children," by C. Wray, p. 228, 1894; "School Ophthalmia," by J. Hutchinson, and discussion, pp. 35-66, 1894.

For the use of teachers the following works may be recommended:—

FERDINANDS: "The School Teacher's Ophthalmic Guide." Aberdeen: Wylie. 6d.

KERR: "Eyesight in School Life," in *School Hygiene*, by Newsholme and Pakes. London: Swan Sonnenschein and Co., 1903. 3s.

MAGENNIS, E.: "The Eyesight of School Children." Ed. 2. Dublin: Browne and Nolan, 1909. 6d.

XI

THE EARS, NOSE, AND THROAT IN SCHOOL CHILDREN

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DISEASES of the ear, nose, and throat in childhood cause deafness and ill-health, interfere with mental and bodily growth, and are responsible for some loss of life. As a large proportion of these diseases have their origin at this period of life when they are most amenable to treatment, the recognition and treatment of them as early as possible is of the utmost importance to the community and to the individual.

THE IMPORTANCE OF MEDICAL EXAMINATION.

If these diseases are not treated, the community suffers from the loss of valuable lives; from the production of unhealthy and inefficient citizens, who are responsible for succeeding generations; and from the waste of time and money in the attempt to educate children who are quite unable to profit by the advantages offered to them. The manner in which the individual suffers will be dealt with in describing the diseases which should be sought for.

Every child should undergo careful and skilled individual examination if the utmost good is to be obtained. It is not sufficient to leave the reporting of deaf children to teachers or to test them "in the lump," for a great deal of early and slight deafness and even unilateral severe deafness must then be overlooked.

Chronic discharge will also be missed, for in some of the cases there is little to attract attention in the way of deafness or in the offensive character or profuseness of the discharge. Again, it is dangerous for children with a perforation in the membrane to bathe in the river, sea, or swimming bath, for not only does a discharge from the ear cause sepsis of the water in a swimming bath and so form a source of danger to others, but the water being cold and not free from micro-organisms may, and often does, cause acute and dangerous inflammation of the middle ear; or it even may, by passing through the perforation into the middle ear, cause severe giddiness and possible death from drowning. Many cases of chronic middle ear suppuration heal leaving a perforation in the membrane with very fair or practically normal hearing, and these cases would certainly escape detection if a careful examination is not made. It may be mentioned that a permanent perforation of the membrane disqualifies a man for active service in the Austrian and Prussian armies.

Varieties of Morbid Affection.

Deaf mutism, or dumbness due to such profound deafness that the child is unable to learn to speak is due either to hereditary malformation or to disease in fœtal or early life of the essential parts of the hearing apparatus.

Such children have to be sent to special schools to learn lip reading and speech, and it is important to recognise them before the age of 5 years so that their tuition may commence as early as possible. Deaf mutism occurs in about one in 2,000 of the children of England, Wales, and the Isles, the average being slightly larger in Scotland and still slightly larger in Ireland.

Impairment of hearing is, of course, simply a symptom of disease. The loss may be considerable and permanent, rendering the child unable to receive instruction in the ordinary class. The permanency of the deafness must be recognised in order that special classes should be given and advice as to a future career. On March 2nd, 1910,

the Education Committee of the London County Council decided to make the experiment of providing at the Ackmar School, Fulham, a special class for these children. This special class to be carried on in the classrooms of the ordinary school, and the children to mix with the others at recreation. In many children the deafness is easily curable, even if severe. In others the loss may be only slight, yet if allowed to continue will become worse and permanent when the battle of life has to be fought. In some the deafness is due to chronic discharge from the middle ear, which is a cause of ill-health, and sometimes of death.

The varying statistics of deficient hearing among school children can be explained in a large degree by the absence of individual skilled examination, and by the want of a standard test. The following is a table given by Dr. Thomas Barr, of Glasgow, who was the first to draw attention to the subject in this country, of the various results obtained by skilled observers in different countries up to September, 1889:—

Surgeon.	Place.	Children Examined.	Found Defective.
Sexton	New York	570	74 or 13 %
Weil	Stuttgart	4,500	1,501 or 33·37 %
Moore	Bordeaux	1,768	300 or 17 %
Bezold	Munich	1,885	414 or 22 %
Barr	Glasgow	600	166 or 27.66 %

Dr. Rohrer reported that in the canton of Zurich in 1899 and 1900, 108,297 children who had reached the school age were examined, and 117 per 1,000 were found to be in some way affected as to their ears.

In 1902 an examination was made by myself of 1,000 children in the Hanwell District Schools, the ages varying from 3 to 16 years, and deficient hearing more or less marked in one or both ears was found in about 50 per cent.

Dr. T. Barr dealt with the relationship between low intellectual power and deafness, and found that in 140 children there were "twice as many with defective hearing among the backward children as among the forward

children." Dr. E. Permewan, of Liverpool, in 1896, drew attention to the same subject. He examined 203 children, and according to the report of their teachers concerning their intellectual sense he divided them into three classes—*good*, *fair*, and *bad*. The result was as follows on testing with a watch which could be heard normally at sixty inches. Of eighty-nine called *good* the average mean hearing distance was fifty-one inches; of fifty called *fair* the average mean hearing distance was forty-seven inches; while of sixty-two called *bad* the average mean hearing distance was $31\frac{1}{4}$ inches—only half of the normal. Later statistics are published by the Chief Medical Officer of the Board of Education, 1908, but they cannot be considered as accurate, for he says: "It may, however, be stated generally, judging from a number of the reports, that defective hearing of a degree to be noticed *by the teacher* exists in approximately 5 per cent. of school children." The italics are mine, for a child must be seriously deaf for the defect to be noticed by a teacher, and according to what has been previously stated, a great deal of ear trouble has probably been overlooked.

Taussig, 1909, found defective hearing in either ear in 7 per cent. of the public school children of St. Louis County, M.O., and in his paper he quotes tables from various parts of the world recorded by Gulick and Ayres in 1908, the returns varying from 1 per cent. to 12 per cent., and suggests that the variations may, at least in part, be due to the fact that in some places any departure from the normal is recorded, whereas in others only a serious defect is noted.

Impairment of hearing being a symptom of disease, it is necessary to search for the cause. The chief causes in childhood are adenoids, middle ear suppuration, and cerumen.

Adenoids, or enlargement of the tonsil at the back of the nose, besides causing deafness, may produce the following important and far-reaching evil effects: Repeated earache or inflammation of the middle ear, which is always a menace to life. Mouth-breathing, in which

the air which is inspired is not warmed, moistened, or filtered as it is if it passes through the nose, consequently rendering a child more liable to infections of all sorts, such as colds, bronchitis, pneumonia, scarlet fever, and measles. The facial expression is stupid owing to the open mouth. The teeth become prominent from the absence of the normal pressure of the lips, and the upper ones become crowded together owing to the narrowing of the alveolar process of the upper jaw, and therefore become carious. Together with the narrowing of the alveolar border the hard palate becomes highly arched. The nose is narrowed and deviation of the septum, causing nasal obstruction, is liable to occur. The speech is thick and nasal, the M's become B's and the N's become D's. The chest is deformed. Snoring occurs during sleep, which is disturbed owing to persistent natural efforts to breathe through the blocked nose, causing an insufficient supply of oxygen and so waking up the child with so-called "night terrors." The general growth is hindered and the mental powers are dulled. Anæmia is often present, and enlarged septic glands on both sides of the neck result. In a certain proportion of instances the adenoid mass is the site of tuberculous infection causing glandular infection or general tuberculosis. In some children, however, quite a large mass of adenoids is present without very marked symptoms, and recurring deafness or earache with slightly nasal speech and a tendency to catch cold may be the only ones. It is often asked when are adenoids of importance? The answer is, when they are causing symptoms, whether the mass is large or small. It is my experience that children who have a smooth-feeling or smooth-looking posterior naso-pharyngeal wall are by far the healthier.

It is quite true that there is a tendency for adenoids to disappear or become smaller as age advances, but they leave behind many troubles which are permanent if they are not dealt with in childhood; they may be likened to a destructive fire in a house, the fire will go out but it does not leave the house in a good condition.

Among the 1,000 Hanwell children adenoids were

present in 434, though slight in amount in thirty-nine. Depression of the membrane and impairment of hearing were found in 166, of which 141 had adenoids. Chronic discharge from the middle ear was found in eighty-eight, of which seventy-one had adenoids. Signs of old suppuration in the middle ear were seen in 247, of which 171 had adenoids.

The report of the Chief Medical Officer of the Board of Education, 1908, gives an average of from 8 to 10 per cent. of children with adenoids, the returns from different parts of the country varying from 4.1 per cent. for Flintshire to 15.7 per cent. for Lindsey County.

Taussig, 1909, found only 0.9 per cent. in St. Louis County, but states that this low percentage is probably partly due to the fact that only well-marked cases were included and partly to the probability that an unusually large proportion receive surgical attention. He gives the following table from Gulick and Ayres:—

New York City (1908)	16.4	per cent.	with	adenoids
Boston (1908) ...	4.7	„	„	„
Chicago (1909) ...	3.7	„	„	„

Middle ear suppuration, besides causing deafness, is a source of ill-health and a constant menace to life, and may be the cause of infection to others of tubercle, scarlet fever, and diphtheria.

Among the 1,000 Hanwell children, chronic suppuration was present in eighty-eight; in six of these the radical mastoid operation was urgently needed, and all were in danger of their lives. The report of the Chief Medical Officer of the Board of Education (1908) gives about one out of every sixty children, the proportion among infants being about one to every thirty. The average from different parts of the country varying from one in thirteen (Bath) to one in 245 (Hull). Among the Hanwell children there were signs of previous suppuration in the middle ear in 247, and of these fifty-seven had permanent perforation of the membrane.

Cerumen, causing deafness in one or both ears, was found in thirty-three of the 1,000 Hanwell children.

Enlarged tonsils interfere with breathing, cause thick speech, and recurring sore throats and quinsies, with septic enlargement of the glands in the neck, and serve as points of infection for diphtheria and tuberculosis with secondary tuberculous glands in the neck or general tuberculosis. Of the 1,000 Hanwell children enlargement was present on one or both sides in 231, and were associated with adenoids in 174. Coues examined 212 children in Boston, and found that enlarged tonsils were present in 153, or over 72 per cent., varying in size from marbles to walnuts and projecting to a marked degree from beyond the faucial pillars. He quotes the result of an examination of about 250,000 children between the ages of 6 and 14 in Austria—30 per cent. had enlarged tonsils, 20 per cent. had adenoids, and both conditions in about 19 per cent.

Among the more rare conditions observed in the Hanwell children were: *Foreign bodies* in the ear in eighteen; *otosclerosis*, an intractable form of deafness, all occurring in females, in six; *hypertrophy of the inferior turbinals*, causing nasal obstruction, in eight; and *marked deviation of the septum* in two.

The Method of Examination.

The examination described may appear at the outset to be tedious, but after it has been practised for a short time it will be performed quickly and easily. The ideal method will be described, but alterations may be found necessary to suit the varying surroundings, but a uniform standard should be maintained as far as possible.

The history of any ear, nose, or throat trouble should be obtained from the teacher or from the parents if possible.

It is necessary to have an assistant; if a nurse is not available the teacher should take her place, but the ideal thing is to have both—at any rate, the teacher should also be present to give confidence to the children.

The room in which the examination takes place should be perfectly quiet, and with available floor space to allow of the child being placed at twenty feet from the examiner. The twenty feet should be chalked off in feet on the floor from the point where the examiner sits. An electric light fixed on the forehead is the best light to use, as it renders the examiner independent of uncertain reflected light, and takes up less time in adjustment. If reflected light is imperative, it may be obtained from a window or an ordinary electric light or from an oil-lamp by means of the ordinary head mirror. The instruments required are a medium-sized and a small aural speculum, a nose speculum (Thudichum's), a metal tongue depressor, a small post-nasal mirror and laryngeal mirror, aural forceps (Pritchard's), two flat-pointed probes for mounting wool mops, a small silver loop on a metal handle for removing cerumen and epithelium, a medium C tuning fork with a footplate (Gardiner Brown's), a Politzer's bag with two metal nozzles so that one can be purified while the other is in use; two 1-oz. glass syringes with fine straight nozzles and projecting finger ledges on the proximal end of the barrel, a metal kidney dish for syringing, a spirit lamp, and some double cyanide wool in a glass or metal box. A conversation tube and a Dalby's "clacker" may also be wanted. A good supply of warm, boiled water should be ready for syringing and for washing the instruments and hands. The instruments and syringes should be kept in a flat shallow tray containing one in twenty carbolic lotion, and when rendered obviously septic they should be wiped and placed in pure liquid carbolic acid for half a minute and rinsed in water before being replaced in the one in twenty. A steriliser may be used, but longer time is required for thorough sterilisation, and it is then necessary to have two sets of instruments. The examiner will find it convenient to remain seated and to have the instruments on a table at his right-hand side.

It will be found of great help if each child after the examination is given a sweet; this may seem a small matter, but it makes the children more eager to be

examined, and helps to make them more amenable and happy.

One child only should be in the room at a time. The child is first placed at the extreme of the twenty-feet range and each ear is tested separately, one being turned to the examiner while the other is blocked up by the teacher. Care must be taken that the child does not look at the examiner during the test, as lip reading may occur. The most reliable test is the forced whisper after forced expiration; in using it simple directions may be given, such as "open your mouth," "shut your eyes," "put out your tongue"; or simple questions asked, such as "how old are you?" "do you like sweets?" "when is your birthday"; or the child is told to repeat anything that it hears, and numbers, letters, and words are used. All these should be mixed up and care taken that the same things in the same order are not used with each child, or in each ear of the same child. If the whisper is not heard at the extreme range, the child is brought nearer and nearer until the range is ascertained and noted. If it is found that the forced whisper is not heard at all, the ordinary conversational voice should be used, and if that is inaudible loud shouting should be employed, and a conversational tube tried. If it is a question of complete or nearly complete deafness, testing with some loud noise-producing instrument, which is as invisible as possible and does not disturb the air, should be used. The "clacker" invented by Sir William Dalby is, in my opinion, the best, and can be obtained at Hawkesley, 357, Oxford Street. The skin sensation in deaf mutes is extremely acute, and disturbance of the atmosphere attracts their attention, and thus may vitiate the test. They are also very quick in seeing the slightest movement. The "clacker" can be held in one hand and made to produce a sufficiently loud noise without any appreciable disturbance of the air and with only the slightest movement of the fingers. The child's attention should be attracted by the assistant while the noise is made from behind in various positions round the head without

coming into the range of vision; if it is heard, the movements of the child's head demonstrate the fact, while absence of any responsive movement will indicate complete deafness, or at any rate deafness of such a degree that lip-reading will have to be taught.

The parts around the ear are then examined, especially the mastoid region, for scars or inflammation, and the adjacent parts for enlarged glands. The meatus and membrane are then carefully inspected and all pathological conditions carefully noted; in doing so it is better not to use a speculum unless it is necessary, for all instruments tend to frighten children; all that is necessary in a great number of cases is to pull the auricle downwards in infants, backwards in older children, and upwards and backwards in still older ones with the fingers of one hand, while the tragus is pulled forwards by drawing on the skin in front of it with the forefinger of the other. Foreign bodies, cerumen and discharge should be removed by the silver loop or by syringing and the meatus thoroughly dried with wool mops in order that the membrane and middle ear may be carefully examined.

The nose should then be examined, and here again a speculum need not always be used, for in infants and young children a good view can be obtained by pressing the tip of the nose backwards with the left thumb, with the fingers resting on the forehead and nose. The nose should be inspected in order: vestibule, floor, septum, and outer wall.

The mouth is inspected in order from before backwards: lips, gums, teeth, tongue, soft palate, tonsils and posterior pharyngeal wall. Placing the forefinger on the tongue is often all that is required.

The eyes and teeth should be specially examined for signs of congenital syphilis.

If the child is tolerant, examination of the post-nasal space should now be made with the mirror; if this is impracticable, the examination with the finger should be postponed until the very last as a child is usually unmanageable after the digital examination.

If thought necessary, the amount of bone conduction and its comparison with air conduction may be made with the tuning fork.

The larynx should now be examined if signs or symptoms demand it.

Both sides of the neck should be investigated for scars and enlarged glands.

If it is necessary to improve the hearing or to verify diagnosis, inflation of the middle ear with Politzer's bag is now applied; in doing so in infants and young children, it is often effective without any action on the part of the child, but crying is often a help and may be taken advantage of; blowing out the cheeks or swallowing water may be used in older children.

The hearing after syringing or inflation or both should then be tested again and noted. If the post-nasal space requires examination and the post-nasal mirror has not been practicable, exploration with the finger should now be done; in doing so, the left arm is passed round the child's head, and the child's left cheek is pressed in between the back teeth with the forefinger of the same hand, the head being held firmly pressed against the examiner's side; the right forefinger is then passed quickly into the back of the throat and swept rapidly up the side of the soft palate into the post-nasal space, when the choanæ and the nasopharyngeal walls can be examined.

A general examination may be necessary to find evidence of predisposing diseases such as syphilis and tubercle.

The following is a simple form which can be typewritten for recording the results of the examination.

The various conditions seen in the membrane, middle ear, nose, throat or larynx can be rapidly drawn in a simple pen-and-ink outline diagram, or special rubber outline stamps can be used. The main headings on the form and any obtainable history should be filled in before the child comes in for examination.

EARS, NOSE, AND THROAT.

Place.	School.	Date.	Number.
.....	.....	.....	.....

Name.	Sex.	Age.
.....	.....	.....

History .....

Right Ear .....

Left Ear .....

Tuning Fork .....

Nose .....

Mouth.....

Pharynx .....

Nasopharynx .....

Larynx.....

Remarks .....

REFERENCES.

"Annual Report for 1908 of the Chief Medical Officer of the Board of Education," pp. 61 to 64. [Cd. 4986.] London: Wyman, 1910. 8½d.

"The Examination of 250,000 Children in Austria." *Journal Amer. Med. Assoc.* Vienna letter. December 4th, 1909.

BARR, THOMAS: "The Hearing of School Children." *Schoolmaster*, September 4th, 1889.

CARTER, R. BRUDENELL, AND CHEATLE, ARTHUR H.: "Sight and Hearing in Childhood." London: The Scientific Press Ltd., 1903. 2s. net.

CHEATLE, ARTHUR H.: "The Report of an Examination of the Ears, Noses, and Throats of a Thousand School Children between the ages of three and sixteen years in the Hanwell District School." *Transactions of the Otological Society of the United Kingdom*, 1902.

COUES, W. P.: "The Results of the Clinical Throat Examination of Two Hundred and Twelve Children." *Boston Medical and Surgical Journal*, vol. clxii., No. 7.

GULICK, L. H., AND AYRES, L. P.: "Medical Inspection of Schools." New York: Charities Publication Committee, 1908. $1.00.

LOVE, J. KERR, AND ADDISON, W. H.: "Deaf Mutism: A Clinical and Pathological Study." Glasgow: James Maclehose and Sons, 1896. 9s. net.

LOVE, J. KERR: "A Study of the Deaf Child." Carnegie Trust Research. *Glasgow Medical Journal*, 1907-1909.

PERMEWAN, W.: "On Defects of Hearing and Mental Deficiency in Children." *Liverpool Medico-Chirurgical Journal*, July, 1895.

ROHRER: "Bericht über die Verhandlungen der Zuricherischen schalsynode." 1901.

TAUSSIG, ALBERT E.: "The Prevalence of Visual and Aural Defects among the Public School Children of St. Louis County, M.O." The Psychological Clinic Press. Vol. iii., No. 6. Philadelphia, Pa.

XII

DENTAL CONDITIONS IN ELEMENTARY SCHOOL CHILDREN

BY

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THE object of this chapter is to indicate the need for systematic dental examination of all school children and to state some of the principles under which the Dental Institute for Children at Cambridge has been conducted, with a view to affording some assistance to those who desire to cope practically with the most insidious and widespread evil dependent on carious teeth and other morbid conditions of the mouth in early life.

The Cambridge Dental Institute for School Children came into existence in 1907 as a private venture. Mr. Sedley Taylor, late Fellow of Trinity College, provided the funds and the writer of this article acted as organiser and dental director, controlling the work of a "whole-time" dentist. After an activity of less than two years, the Institute was taken over by the borough council, who had previously expended an annual sum of £50 for inspection only. The present borough dentist appointed is A. W. Gant, L.D.S., Eng., to whom I am greatly indebted for most of the material on which this chapter is based.

Examination of School Children for Dental Defects.

All the examinations should be conducted at the schools. The time spent with each child varies considerably, the elder ones taking a longer time than the very young children, on account of their greater number of permanent teeth requiring examination. With very young children a mirror will generally suffice to discover all the caries in the temporary teeth, as unfortunately it is very extensive. In examining the permanent teeth it is necessary to explore each one thoroughly with a very fine probe, in order to detect the earliest traces of caries beneath the food-debris which covers them. On the average from twenty-five to thirty-five children can be so examined in one afternoon. Some seven or eight more children can be examined each afternoon when the examination is held separately from the medical inspection.

At Cambridge it has been found that only 2 per cent. of all the children examined had sound teeth. This result was obtained by dentists, and therefore by a kind of examination quite different from those now being conducted by the school medical officers throughout the country.

Our conviction being that inspection without treatment is futile, the object was not as has been stated to obtain statistics, but to provide a guide for the necessary treatment. Lest it should be thought that the low percentage of sound teeth observed at Cambridge is only local, I may mention that a very similar examination, *i.e.*, by dentists, was made at Kettering, and showed the percentage of healthy mouths (*i.e.*, sound dentitions) to be 3 per cent. Professor Jessen, in examining all the school children of Strassburg, found only 2.6 per cent. with sound teeth. Similar figures have been returned from an examination of school children's teeth in New York.

These figures, coming as they do from such widely different centres, give us no option but to be convinced that more than 90 per cent. of all our school children have carious teeth to a greater or less degree. Special attention

should be paid to the circumstance that all these examinations were conducted by dentists with the aid of a mouth-mirror and probe; Whereas Dr. Hogarth,[1] advising as to the methods of the school doctor, says:—"Then comes the examination of the mouth. Simple inspection is all that is required. Small wooden spatulas, or even the child's handkerchief, may be used to depress the tongue. The number of decayed and missing teeth are noted as well as any oral sepsis or impairment of function; the child is referred for appropriate treatment to the dentist. Where a dental surgeon or assistant is attached to the school, this part of the examination may be left to him. In any case it is sufficient to ascertain only the above-named particulars. Special classification is unnecessary." This no doubt is quite right from the medical point of view, and in consonance with the departmental view, but utterly wrong from the dental standpoint, and valueless as far as the individual and the State are concerned.

The Examination of Temporary Teeth.—From the third and fourth years taken together to the fifth year the number of temporary carious teeth per child rises from 5.8 to 7.3, an increase of 1.5 for the year. From five to six years the rise is about 1.4. As no teeth are normally shed before seven years of age, this increase may be fairly taken as the average progress of caries in the temporary teeth, *i.e.*, about three become carious every two years.

At 12, 13, and 14 years more than half the children retain one or more temporary teeth each. At these ages no temporary teeth ought to be allowed to remain in the mouth, since in every case the permanent tooth is formed by that time and ready to move into its proper position. The undue retention of temporary teeth causes the permanent teeth to become irregular, and hence more liable to caries.

In reference to the teeth of the first set at the age of seven years, there are more *carious* than sound teeth. At this age it is usual to find that most of the teeth already

[1] HOGARTH: "Medical Inspection of Schools." London: Henry Frowde and Hodder and Stoughton, 1909. 6s.

carious have lost nearly all their grinding surface; and if in conjunction with this there is even one unsavable permanent tooth in the mouth, such a child has lost at least half its grinding capacity. Among the classes where the supply of food is limited such a condition must add considerably to the malnutrition which is so prevalent. It is not only important to preserve these temporary teeth, especially those of the upper jaw, because unless they are retained in their proper position until the other teeth are about to appear, there is a great liability that the permanent teeth will prove very irregular, and consequently more liable to extensive caries.

The Examination of Permanent Teeth.—The first permanent teeth which appear are the six-year molars, which, as their name implies, make their first appearance about the sixth year, though this date is subject to considerable fluctuations. At from five to seven years of age these are, with very few exceptions, the only permanent teeth which have appeared. At five years about 25 per cent. of the total number of permanent teeth in the mouth are carious, and at six years 27 per cent. This reveals a very serious evil, since, as these molars take some months to attain their final position, one in four of them is carious before it has had time to reach contact with its corresponding tooth in the opposite jaw and be of any use in mastication.

Dental Treatment.

From the eighth year upwards all the children examined at Cambridge have had some permanent teeth.

A considerable portion of all the children of 5 and 6 years of age with carious teeth have been treated, and especial attention has been given to children of these years in order to attain this result. Practically all such children as had been classed in the examinations as having "savable" teeth were invited, through their parents, to attend. The difference between the number of such children and of those made "artificially sound" is mainly accounted for by many failing to take advantage of the treatment thus offered.

Children with "Unsavable Teeth."

From 10 years of age upwards children with "unsavable" teeth form a considerable proportion of the cases examined. At some previous time the teeth were all savable. Subject to rare exceptions, if all these teeth were timely saved, and received periodical attention, no others could become "unsavable" during school life.

Any plan for the dental treatment of school children must be somewhat restricted at present by the presence of unsavable dentures. In private practice many of these teeth could be saved by root-filling, crowning, and other costly methods of procedure, which would be impracticable in a public institution. An unsavable tooth has a ruinous effect on the whole denture, since it renders the one opposite to it in the other jaw valueless, and much more liable to caries. When both sides are thus affected (which is almost invariably the case with the elder children) any treatment such as a school dentist could apply would be of no permanent value. The fundamental principle at Cambridge has been prevention rather than the cure of already existing evils.

It soon became evident, that at least for the present, no effort could be made to cope with the carious temporary teeth, of even the youngest children, beyond extracting those that were either unduly retained, or which, by forming pus, were a menace to the child's health; and when practicable applying a dressing of silver nitrate to those teeth which might be made useful for a little longer by such treatment.

Our problem in Cambridge was to do the utmost good, so as to get the greatest benefit for the greatest number, in view of a necessarily limited income. The only solution was to start with the youngest, and once we had treated a child we assumed the responsibility of keeping its permanent teeth in good condition until it should leave school, and that without any further recourse to the forceps. Consequently our age limit advances annually by one year for previous patients.

We deemed it better to make the teeth of nine children with one decayed tooth artificially sound, than to spend more time in making one child with nine decayed teeth artificially sound. It is getting a maximum advantage for a minimum expenditure.

General Condition of the Teeth and Gums.

During the examinations each child, in addition to having every tooth scrutinised, was classified according to the general condition of its teeth and gums into one of three classes: (*a*) Those with the gums healthy; (*b*) those with very dirty teeth and inflamed gums caused by the presence of one or more dead teeth which were discharging pus; and (*c*) those with mouths in such a septic condition as to threaten seriously their general health and well-being. According to this arrangement the number of children in each class was: (*a*), 1,905; (*b*), 884; (*c*), 157. These figures reveal a very serious condition of things apart from those evils proceeding from caries which directly affect the masticating power alone. They show that, roughly speaking, 1,000 out of 3,000 children had free pus in their mouths, some of which would be swallowed every time food was taken, while other portions of it, thrown out in speaking or singing, would go towards polluting the school atmosphere and lowering the vitality both of children and teachers.

Hygiene of the Mouth.

With regard to cleanliness of the teeth, none of the children, with very few exceptions, were found to use a tooth-brush, and practically in every mouth examined the teeth were covered with a film of food-stuff or tartar and partially stained. This condition varied considerably in degree with different children, but even those who had a tooth-brush only used it irregularly and far from thoroughly.

It seems somewhat incongruous that teachers are supposed to give some instruction about the hygiene of the teeth when they themselves have not had the opportunity

to acquire even the most rudimentary knowledge concerning it.

The advantage of having and using a tooth-brush has been strongly urged on the children at the Institute. General class teaching in hygiene on the subject of teeth is, of course, of great importance, but it is clear that in order to make any real headway in this direction the parents must be brought to recognise the necessity for cleanliness of the mouth. It is manifestly of even greater moment to prevent caries of the teeth than to cure it.

The Local Education Authorities (Medical Treatment) Act, 1909, will have a very considerable effect on the treatment of school children's teeth. The chief difficulty encountered by the Cambridge Dental Institute has been in persuading the parents to send their children for dental treatment, although it was absolutely gratuitous. This shows that the value of any dental clinic will largely depend, for some years to come, upon the educational effect which it produces on the community. It was conclusively proved by that most praiseworthy effort which was made at Kettering that any scheme which includes the charging of even nominal fees is doomed to failure, owing to ignorance and apathy as to what parents can and should do for their children if they want to build up a healthier British race. "Forewarned is forearmed."

REFERENCES.

The literature actually dealing with dental conditions in elementary school children is meagre, but the following may be of service:—

Reprint of the seven Reports of the Committee appointed by the Representative Board of the British Dental Association to Conduct the Collective Investigation as to the Condition of the Teeth of School Children. London: John Bale, Sons, and Danielsson, 1891. 2s. 6d.

CUNNINGHAM, G.: "Defective Personal Hygiene as it Affects the Teeth." Seventh International Congress of Hygiene and Demography. Sect. iv. (Infancy, Childhood, and School Life). London: J. P. Segg and Co., 1891. 6d.

CUNNINGHAM, G.: "Experiences of a School Dental Clinic." *British Dental Journal.* London, September 15th, 1908.

CUNNINGHAM, G., AND GANT, A. W.: "Report on Dental Inspection and Treatment of School Children for the year October 29th, 1907, to October 28th, 1908." Cambridge: Published by the Corporation, 1909. 6d.

CROWLEY, R. H.: "The Hygiene of School Life," p. 43. London: Methuen and Co., 1910. 3s. 6d.

DUKES, C.: "Health at School." 4th edition, p. 187. London: Rivingtons, 1905. 10s. 6d. net.

FISHER, W. M.: "Compulsory Attention to the Teeth of School Children, Cambridge," 1885, and subsequent articles, *Transactions British Dental Association*, 1886 and 1891.

HOGARTH, A. H.: "Medical Inspection of Schools," p. 160. London: Henry Frowde, Hodder and Stoughton, 1909. 6s.

JESSEN, E: "Schulzahnflege und Schule." Vol. ii., p. 495.

JESSEN, E.: "The Care of the Teeth in the School." "Second International Congress on School Hygiene," vol. ii., p. 515. London: Royal Sanitary Institute, 1908. 5s.

MACKENZIE, W. L.: "The Health of the School Child." London: Methuen and Co., 1906. 2s. 6d.

MACKENZIE, W. L., AND MATTHEW, E.: "The Medical Inspection of School Children," p. 255. Edinburgh: William Hodge and Co., 1904. 10s. 6d. net.

PEDLEY, R. D.: "The Diseases of Children's Teeth." London: Segg and Co., 1895. 3s. 6d.

PEDLEY, R. D., AND HARRISON, F.: "Our Teeth: how built up, how destroyed, how preserved." London: Blackie and Son Ltd., 1908. 5s. net.

WALLIS, C. E.: "Recent Progress in School Dental Hygiene." *School Hygiene*, vol. i., No. 1, January 1910. London: School Hygiene Publication Co. Ltd. 6d. net.

WALLIS, C. E.: "Teeth of Children of Michael Faraday School, Walworth," "Second International Congress on School Hygiene," vol. ii., p. 511. London: Royal Sanitary Institute, 1908. 5s.

XIII

MENTALLY DEFECTIVE CHILDREN

BY

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IT is impossible in a work of this kind to omit a consideration of the mentally backward and defective school children.

These handicapped lives give rise to perplexities during the school-going age. In later years, as we now know, many of our social problems are intimately related to this unfortunate class.

HISTORICAL REFERENCES.

The Elementary Education Act of 1876, by making the attendance of children at school compulsory, brought under observation a large number of defective children who had hitherto escaped official notice. It was found that many of these were suffering from such serious defects of body or mind as to be quite incapable of being educated in the ordinary schools, and a Royal Commission was appointed to inquire into the question. This Commission was chiefly concerned with the Blind, Deaf, and Dumb, but also drew attention[1] to the mentally defective, and advised

[1] Report of the Royal Commission on the Blind, Deaf and Dumb. London: Eyre and Spottiswoode, 1889.

that these should be separated from ordinary scholars, and should receive special instruction. Acting upon this suggestion, the school authorities of London, Birmingham, Bradford, Brighton, Bristol, Leicester, Nottingham, and Plymouth, organised special classes for the education of feeble-minded children. But although special accommodation was provided there were no special grants to meet the increased expenditure, and in 1894 the London School Board urged that legislation should be introduced in order that they might provide for these children on similar terms to the blind and deaf. These recommendations led, in 1896, to the appointment of a departmental committee to consider the matter. This reported in 1898,[1] and resulted, in the following year, in the passing of the Defective and Epileptic Children Act.[2] This measure was the first legal recognition in this country of the mentally defective child, and since its passing the training of these children may be said to have become an integral part of our educational system. The Act is permissive and not obligatory, and its provisions are, briefly, as follows:—

(1) Local school authorities may make arrangements for determining what children in their district are defective and epileptic;

(2) They may provide for the education of the same by special classes and schools;

(3) Where such classes or schools are established within reach of the child's home, parents are under obligation to send their children to these schools.

(4) The period of compulsory education extends to 16 years (instead of 14 years as in the case of ordinary children).

The Definition of a Mentally Defective Child.

This Act of 1899 defines mentally defective children as those who "not being imbecile, and not being merely dull

[1] Report of Departmental Committee on Defective and Epileptic Children. [Cd. 8746.] London: Wyman and Sons Ltd., 1898. 5d.

[2] Elementary Education (Defective and Epileptic Children) Act, 1899 [62 and 63, Vict., ch. 32].

and backward, are defective, that is to say . . . . by reason of mental defect are incapable of receiving proper benefit from the instruction in the ordinary public elementary schools, but are not incapable, by reason of such defect, of receiving benefit from instruction in such special classes or schools as are in this Act mentioned."

Statistical Considerations.

The number of mentally defective children was estimated by the departmental committee as approximately 1 per cent. of the elementary school population. This estimate was mainly based upon the inquiries of Dr. Francis Warner, who examined 100,000 school children, and to whose careful and comprehensive researches the greater part of our early knowledge of these children is unquestionably due. For some years no other statistics were available; but the recent Returns of the Royal Commission on the Feeble-minded[1] which, besides being obtained under more advantageous conditions, also relate to a wider area, now permit of a somewhat more accurate estimation. These latter statistics were obtained from eleven selected areas of England and Wales, having an aggregate elementary school population of 436,833, and they show that mentally defective children form .83 per cent. of the elementary school population of the country, the total number in England and Wales being 50,665.

It is to be remarked, however, that this percentage is the mean average of widely divergent extremes, and, as a matter of fact, the incidence of mental defect varies very considerably in different parts of the country. Thus, at Durham it is only .24, and at Hull .30; whilst at Birmingham it is 1.03, at Manchester 1.20, and at Dublin as high as 1.85 per cent. of the school population. To a certain extent this variation coincides with a similar variation in the incidence of insanity, and is the result of causes which cannot here be discussed. Apart from this, however, mentally defective children would appear to be most

[1] Report of Royal Commission on the Care and Control of the Feeble-minded. London : Wyman and Sons Ltd., 1908.

numerous in densely populated urban centres, and least so in agricultural districts. But there is a fallacy here; there is no doubt that many so-called defective children of the towns, even many attending special schools, are not defective in reality but are merely dull and backward, and the inclusion of these causes the proportion of urban cases to appear greater than it really is. I doubt whether real defectives are much more numerous in towns than in the country, and it is certainly a fact that the grossest degrees of amentia—namely, imbecility and idiocy, and even feeble-minded adults (who are merely defective children grown up)—are actually more prevalent in rural than in urban districts. With regard to sex incidence, there is a marked preponderance of males, the relative proportion of boys to girls being approximately as three to two.

The Pathology of Feeble-mindedness.

It is impossible to give here more than a very brief account of the morbid anatomy underlying mental defect, and the reader who desires fuller information on this point is referred to the works and special articles mentioned at the end of this chapter.

What may be the precise relationship between mind and matter we do not know, but that there is a close relationship is certain; consequently we should expect the defective mind to be accompanied by a defective brain. In the more severe grades of defect, idiocy and imbecility, anomalies of size, configuration, or consistence, are usually obvious; in the milder conditions of mental defect, however, naked eye changes may not be marked, and the condition may only be revealed by the microscope. The chief microscopical changes which have been found are an irregular arrangement, an incomplete development, and a numerical diminution of the cells of certain regions of the cortex. It used to be thought that the grosser pathological conditions and developmental anomalies which are so often present in the brain of the ament, were the cause of the defect of mind; but more recent inquiries have shown that these are of importance only in so far as they affect the

cortical cells, and it is the imperfect development of these latter that we must regard as the essential basis of mental deficiency.

Factors in Causation.

In the mentally defective one or more causes have arrested or interfered with the normal proliferation and development of the cortical cells of the brain, for these cells are both fewer in number and imperfectly developed. The question is: to what is this due?

In the course of its development the brain is subject to the action of two forces, intrinsic and extrinsic—in other words, heredity and environment. It is to the former of these that we must undoubtedly attribute an overwhelming proportion of cases of mental deficiency.

I have made careful inquiries into the antecedents of several hundreds of feeble-minded persons, and have found that three conditions occur so frequently that it is impossible to look upon the association as merely accidental. These are (1) antecedent mental defect, insanity, epilepsy, or other serious anomaly of the nervous system; (2) tuberculosis; and (3) alcoholism. I do not deny that such conditions may, and do, occur in the genealogical tree of individuals who are perfectly healthy in body and mind, but in these cases of mental defect it is not a single insane, consumptive, or alcoholic ancestor that we find, but a marked family tendency to one or more of these conditions. To give actual figures I may say that in my own series of cases of amentia (which embraced the severe as well as the mild grades) over 80 per cent. of the sufferers were the descendants of a pronounced neuropathic stock: 46.5 per cent. showed a family history of marked alcoholism; and 34 per cent. of tuberculosis. There are, of course, other hereditary factors concerned in the production of amentia, for it is a condition the cause of which is rarely single, but I believe these three to be the chief.

Want of space prevents any discussion as to the manner in which these morbid ancestral conditions act. In brief, however, my opinion is that in some way or other they

have so devitalised the germinal plasm as to render the normal and perfect development of the embryonic rudiment impossible. Naturally, the effect is most manifest in that structure which is the most complicated, most unstable and latest acquired, namely, the higher centres of the brain concerned with mind. But the effect is by no means necessarily confined to the mind: the body often suffers also, as is seen in the frequent occurrence of those anatomical anomalies of development known as "stigmata of degeneracy."

But whilst morbid heredity undoubtedly accounts for an overwhelming majority of these cases, there is a small proportion in which this is absent, and which must be referred to factors of the environment. These causes may operate at any of the three periods, before, during, or after birth, and they produce more or less definite cerebral lesions with secondary arrest of neuronic development. The chief factor acting *before* birth is usually a circulatory toxin, such as lead or alcohol; but occasionally starvation or severe ill-health of the mother during the period of gestation appears to lead to a similar result.

Feeble-mindedness may occasionally arise from injury inflicted upon the brain *during* birth, and the commonest lesions are asphyxia or hæmorrhage. Such cases are not very numerous, but they form a fairly characteristic class, and it is important for the practitioner to remember that mental defect may arise in this way.

Lastly, feeble-mindedness may be caused *after* birth by involvement of the brain during, or after, scarlet fever, measles, diphtheria, whooping-cough, otitis, or rhinitis. The most common cause at this period, however, is a special infection of the brain known as Polio-encephalitis acuta, which was first described by Strümpell and which is probably similar to the acute inflammation occurring in the cells of the anterior horn of the spinal cord.

It is thought by some people that the environment may be an important factor in producing mental defect, more particularly that combination of conditions which are comprised in what is generally known as "slum life." I

believe this to be a complete mistake. Insufficiency of food, of warmth, and of pure air may, it is true, have some effect in retarding mental development, yet it is notorious that the children of the slums, although of wretched bodily physique, are often immeasurably superior in their mental capacity to the lusty offspring of the agricultural labourer. But I have never seen a case of idiocy or imbecility so caused, and in my opinion the great majority of the cases of feeble-mindedness which are alleged to be caused in this way are not defective at all, but simply suffering from a retardation of development which is curable. The mistaken diagnosis which causes these children to be sent to special schools not only results, therefore, as we have seen, in a seemingly greater incidence of mental defect in a town as compared with a country area, but also in totally erroneous views as to the curability and the real nature and cause of mental deficiency.

Clinical Characteristics.

We may now consider the clinical characteristics of these feeble-minded children. I will first of all describe those cases due to morbid heredity, to which I apply the term "*Primary*." As already remarked, these are by far the most numerous, probably eight or nine-tenths of all mentally defective children falling within this group.

Mentally defective children differ very much in the degree of their deficiency. The lower members of the class are with difficulty separated from the imbeciles. The higher ones, on the other hand, are in some ways but little removed from the dull and backward of the normal population. It is clear, therefore, that no general description can be given which will be applicable to every mentally defective child, and the following account simply enunciates their main characteristics.

With regard to their physical condition, a small number might perhaps pass as normal; but such cases are exceptional, and the majority present unmistakable anomalies of bodily structure or function in addition to their intellectual defect. Remembering that their condition is the result

of a germinal imperfection, this is what we might expect. Anatomical anomalies, or "stigmata of degeneracy," are, of course, neither so plentiful nor so pronounced in the feeble-minded child as in the imbecile or idiot; nevertheless, they occur in over 90 per cent. of these cases and in nearly a quarter of them the defects are triple. The cranium is the commonest site of anomaly, being bossed, ridged, asymmetrical or otherwise abnormal in shape or size in fully half of these children. Between the ages of 7 and 10 years, the maximum circumference is generally about half an inch less than that of a normal child of corresponding age and sex, but as time goes on this discrepancy becomes more and more marked, and by the 14th or 16th year the difference is often as much as an inch. Malformations of the palate and then of the external ear and eye occur next in frequency to those of the skull.

Inquiries will nearly always show that dentition, sitting up, standing, walking, and talking have been abnormally late. The child may be 4, 5, or even 6 years before he says a word. This retardation continues with advance in years, and at every period of its school life the mentally defective child compares unfavourably in its bodily growth and intellectual acquirements with the one of normal intellect. The bodily functions are often imperfect; thus, the circulation is feeble, so that chilblains and sores are frequent in cold weather; assimilation is defective, so that the child remains thin and ill-nourished in spite of good feeding; vitality generally is diminished, and catarrhs and ill-health are exceedingly common. Mentally defective children average two to four inches less in height, and from three to twelve pounds less in weight than normal ones of similar age and sex.

Anomalies of nerve action—the abnormal nerve signs of Dr. Warner—are very frequent. In some children there is a marked diminution of activity, and such are stolid, inert, and laboured in all their movements. In others the reverse is the case, and there is an excess of movement. These latter cannot sit or stand still; they are distracted from their task by every little thing round

them, and they are often full of tricks and habits. Co-ordination of movement is slowly and laboriously acquired, and the making of pothooks and hangers presents difficulties unknown to the ordinary child.

Speech, besides being late in making its appearance, is also defective in fully one-third of these cases. It may be remarked that inability to pronounce not one particular, but many consonants, is usually indicative of mental deficiency.

With regard to their mental condition, sensory defects are not a prominent feature of the feeble-minded grade of amentia. Defects of hearing occur in about 8 per cent. of cases, but are generally due to disease of the middle ear; defects of vision occur in about 15 per cent. of cases. Many of these children appear to be colour-blind, but as a matter of fact colour-blindness is not really any commoner than in the normal, and the mistake is caused partly by their defective attention, and partly by their ignorance of colour names. Active or voluntary attention is very commonly deficient, and very few of the children have any capacity for sustained effort. The most trifling thing serves to distract them from their lesson or occupation, so that, even where the attention is readily gained, it is with difficulty held. Memory is often said to be defective, but I think that in many cases this arises from imperfect understanding. In regard to things that are really comprehended feeble-minded children seem to have quite as tenacious a memory as do those of ordinary intelligence. As a class they have little initiation or originality, and, although some of them can copy with remarkable accuracy, the majority are not as imitative as are normal children. Control is generally deficient, and action is more often the result of sudden desires and impulses than of any deliberate purpose. They are capable of the simple feelings of pleasure, pain, fear, astonishment, anger, surprise, and the like, but their emotions are usually weak and evanescent.

It is, however, in the faculty of judgment and reasoning that the chief defect of these children lies, and, whatever may be the condition of the subordinate mental

functions just referred to, there is always an impairment of this, the highest, constituent of mind. It is impossible, and indeed unnecessary, to describe the countless ways in which this is manifest: the careful observer will find evidence of it in almost every action of school and home life, and it is well expressed by the popular saying that these children have no "common sense." This defect characterises all the varieties and grades, including those of the secondary form to which we shall presently refer, and it obviously has the most important influence upon their whole career. Whilst the ordinary child of 14 or 16 years has not only a good knowledge of common things and events, but has also developed considerable power of comparing, relating, and judging, of tracing a connection between cause and effect, and of shaping his course in accordance with a definite ideal, the feeble-minded one still remains simple, childish, and markedly lacking in judgment. The facts which he has learned are of comparatively little use to him, for they cannot be applied to the exigencies of daily life, and hence it results that, when school is passed, he is quite unable to make any headway or even to hold his own in the world without the supervision of some kindly eye.

Many, perhaps the majority of these children, are quiet, happy, obedient, and inoffensive creatures; but in some there is present, in addition to the mental defect, such a marked deficiency or perversion of the moral sense as to make them a source of endless worry and anxiety to all who have to do with them. Such will lie, pilfer, and misconduct themselves in a thousand and one ways without the slightest compunction. Some are exceedingly cunning in the commission of their offences; others will be guilty of atrocious cruelty to smaller children or to dumb animals; others will make utterly unfounded accusations against teacher or companions with such an amount of circumstance and appearance of truth as readily to deceive the unwary.

It is obvious that these propensities necessitate the most watchful attention on the part of teachers and parents, and add enormously to the difficulties of school training.

The term "*secondary*" is applied to that group of cases in which the growth of a portion of the cerebral cortex has been arrested by disease or injury. I have already mentioned the chief causes according as they act before, during, or after birth; for purposes of description, however, these secondary cases may be divided into two pathological groups which we usually call "vascular" and "toxic."

The best example of the vascular group is seen in those cases which are due to injury inflicted upon the brain during birth, and the clinical picture is usually as follows:—

The labour is generally a protracted one and the child is born in a more or less asphyxiated condition from which he is revived with great difficulty. But he remains torpid, his respiration is apt to be slow and irregular and his pulse feeble. The pupils may be contracted and the anterior fontanelle is often tense. He does not cry, and evinces little interest in the breast. Usually in a few days convulsions make their appearance and in between these the muscles often remain rigid and opisthotonos may even be present. At a somewhat later period paralysis may be noticed; sitting up, walking, and first attempts at speech are all delayed, and after a time it is seen that the child's behaviour is not quite like that of other children. In a few cases he is listless and indifferent, but more often he is restless and exceedingly difficult to pacify. When the age for school arrives the child is found to be incapable of learning or of making any mental effort.

In the toxic group the cause, as already remarked, may be involvement of the brain consequent upon one of the ordinary acute infections; more often, however, it is a special primary infection of the cortical cells. The onset, which is often attributed to sunstroke, consists of malaise and vomiting; these are followed by restless delirium or unconsciousness, fever, convulsions, and often paralysis with exaggerated reflexes. In course of time, if death does not supervene, the fever abates, the convulsions cease or continue only at rare intervals, the child recovers consciousness and some amount of improvement takes place

in the paralysis. But the psychic functions have been damaged, in some cases an obvious impairment of the intellect is noticed immediately, in others only as the child begins to get about and mix with his companions. If he had begun to speak he may now be speechless. The playmates and games of which he was formerly fond now cease to attract him, and, in short, there is a marked alteration in his whole disposition and behaviour. As time passes it is found that his capacity for learning has been interfered with, and it becomes evident that the illness has brought about a more or less serious arrest of mental development.

There can be no doubt that a large proportion of those children in whom the brain is thus involved by a vascular or toxic lesion die in the early years of life. The cases which come under our notice are the non-fatal residue, and they are usually, but not always, characterised by Jacksonian or epileptic convulsions, and a varying degree of paresis or paralysis. In those with paralysis there is generally more or less arrested development of the paralysed limb. Unlike the primary group of cases, stigmata of degeneracy are absent, and these children, instead of being unpleasing or even repulsive in appearance, are often quite well-favoured.

Diagnosis.

The fact that a considerable proportion of children certified for admission into special schools subsequently prove to be non-defective is proof that the diagnosis of this condition is by no means easy. The following are the considerations upon which it must be based.

The Family History.—As we have seen, morbid heredity is present in such a large proportion of these cases that the presence of a marked family heredity of insanity, epilepsy, or consumption, in a child of subnormal intellect, makes it extremely probable that the condition will turn out to be real amentia. On the other hand, a clean family history is of value as indicating that the dulness may rather be temporary and the result of some removable bodily disorder.

The Personal History.—This often affords most valuable information. In cases of primary mental deficiency it will nearly always be found that a general retardation of development, with mental dulness or marked peculiarity, has been present from soon after birth. In infants with a psychopathic heredity, marked and persistent restlessness which cannot be accounted for by bodily ill-health, is a very suspicious symptom. The same may be said of abnormal placidity and indifference to surroundings. On the other hand, in the secondary form of mental defect, inquiries will nearly always reveal a clear history of epilepsy or of some serious toxic or vascular lesion of the brain, previous to which the child's condition has been normal.

The Examination of a Mentally Defective Child.

Having obtained as full particulars as possible regarding the two preceding points, the next duty of the physician is to make a careful examination of the child. It is, of course, with regard to his mental status that he is called upon to decide, but a careful and routine examination of the bodily organs must on no account be omitted, since this often affords data of the utmost value. The points to which special attention must be paid are the presence of any disease or serious disturbance of the bodily health which might produce mental hebetude, abnormal nerve signs, and stigmata of degeneracy. The eyes, ears, nose, and throat require to be particularly examined, for disease of these frequently causes mental dulness to such an extent as to closely simulate mental defect, and I have often had children produced by the school teacher as serious cases of defect who merely wanted the attention of the aurist or nose and throat specialist. Abnormal nerve signs are very common in mental deficiency; they are not, however, diagnostic of this condition and may simply indicate a neurotic child. The presence of even several stigmata of degeneracy is not, of course, pathognomonic of amentia; but it is strongly suggestive of that condition,

especially if associated with a psychopathic family history.

The most difficult examination of all is the psychological one, for the line between the pathological state of amentia and the lowest physiological one of mere dulness may be extremely ill-defined. It is here that a large experience of defective children and a thorough familiarity with their characteristics are essential to accuracy in diagnosis. There is no single psychological test of amentia, but it may help the medical inspector to remember that, whereas in the merely dull and backward child the condition is one of uniform mental sloth, in the ament careful examination will usually reveal some definite impairment of perception, attention, memory, association, or volition, whilst the judgment is always defective. Bearing in mind these points the physician who, after careful consideration of the child's history, appearance, manner, behaviour, scholastic and manual ability, spends ten minutes in judicious conversation with him, will rarely experience much difficulty in arriving at a correct diagnosis.

Differential Diagnosis.

Finally, a few words may be said about certain conditions which may be mistaken for mental defect. Perhaps the commonest error is with regard to children who are merely "dull and backward." These are the least intellectually gifted of the normal population, and they are found in all schools to the extent of from 5 to 20 per cent. Differentiation may be very difficult, but I think that attention to the preceding points will usually prevent any mistake. It is to be remembered that the dulness and backwardness is usually confined to school work and that out of doors these children are quite able to take care of themselves.

There is another group of children whose development is not arrested but merely delayed. These are the result of an adverse environment, and the causes are usually insufficient food and general home neglect. If these or other conditions which may give rise to impaired nutrition are known to exist the examiner will be wise to withhold a

definite opinion until the child's bodily condition has been improved by suitable treatment. Mental dulness to a marked degree may, as already mentioned, result from more serious disease, and hence the importance of a thorough physical examination. Nervous exhaustion due to overwork, mental hebetude following epileptic fits, even insanity, may all be mistaken for amentia, but care will usually suffice to distinguish them. Lastly, the mentally defective child has to be separated from the imbecile. Theoretically this is impossible, for the one state merges into the other; in actual practice, however, if we exclude a few cases on the border-line, it is not difficult, for the mentally defective child can be trusted to carry simple messages, run errands, and do little tasks which will eventually lead to his useful employment, whilst the imbecile can do none of these things.

Mentally Defective Children and the State.

So far we have been solely concerned with the relations of the defective child to the education authority. The account has necessarily been brief, and for fuller particulars the reader is referred to the work of the author on "Mental Deficiency." It is impossible to end this short account, however, without a few words as to his relation to society at large—to the State—for to this end training is merely the means. It must be confessed that the Act of 1899 has been a failure. In the first place, its permissive nature has resulted in its being practically a dead letter throughout the greater part of the country. Thus, whilst in the year 1907 the number of feeble-minded children was approximately 50,000, the number for whom educational facilities existed was only 9,000, and considerably more than half of this accommodation was in London alone. At first sight the remedy would seem to be to make the Act compulsory, but even then, in my opinion, it would still be a failure unless supplemented by some definite system of after-care. The real truth is that mental defect is incurable; it may be, and is, ameliorated by special training, but by no method, however elaborate, can these

children be converted into normal persons able to hold their own in the world and to look after their interests without supervision. Children they always remain, and, if suitable work is not found for them and their daily life not subject to some kindly oversight, degradation is sure to result, and the training they have received becomes simply so much waste time and money. At present, beyond a few voluntary homes and after-care committees, absolutely nothing is done for mentally defective children after school age, and I cannot but regard it as the height of folly to provide these children with an elaborate and expensive education until the age of 16 years and then to turn them adrift to shift for themselves as best they may—at the precise age, be it remembered, when the emotions and passions are undergoing rapid development and when guidance, control, and regular habits of life are of vital importance. That this neglect is attended with the most disastrous consequences to the feeble-minded young men and women themselves, to the State, and to posterity, has well been shown by the recent Report of the Royal Commission on this subject, and I am convinced that the establishment of a definite system for the care and control of these children after leaving school on the lines laid down in this Report is one of the most urgently called for reforms of the present day.

REFERENCES.

Reference should be made to the following official reports:—

"Report of Departmental Committee on Defective and Epileptic Children." London: Wyman and Sons, 1898. [Cd. 8746.] 5d.

"Royal Commission on the Care and Control of the Feeble-Minded." 8 Vols. London: Wyman and Sons, 1908. £2 6s.

"Royal Commission on the Blind, Deaf, and Dumb." London: Wyman and Sons, 1889.

Barr, M. W.: "Mental Defectives." London: Rebman, 1905. 17s. 6d. net.

Beach, F., and Shuttleworth, G.: "Idiocy and Imbecility," in "System of Medicine." Edited by Sir Clifford Allbutt. Vol. viii. London: Macmillan, 1899. 25s.

Duncan, J.: "Training and Education of the Feeble-minded, Imbecile, and Idiotic." London, 1866. 5s.

Ellis, Havelock: "The Criminal." 3rd Ed. London: Walter Scott Co., 1901. 6s.

Hammarberg, K.: "Studien über Klinik und Pathologie der Idiotie." Upsala: 1895.

Ireland, W. W.: "The Mental Affections of Children: Idiocy, Imbecility, and Insanity." 2nd edition. London: J. and A. Churchill, 1900. 14s.

Langdon-Down, J.: "On some of the Mental Affections of Childhood and Youth." London: J. and A. Churchill, 1887. 6s.

Lapage, C. P.: "Feeble-Mindedness in Children." *Medical Chronicle*, 1905.

Lewis, W. Bevan: "Text-book of Mental Diseases." 2nd Ed. London: Griffin, 1899. 30s.

Séguin, Ed.: "Traitement Moral, Hygiène et Education des Idiots, etc." Paris, 1846.

Shuttleworth, G. E.: "Mentally Deficient Children." London: H. K. Lewis, 1900. Price, 5s.

Sollier, P.: "Psychologie de l'Idiot et de l'Imbecile." Paris, 1891.

Tredgold, A. F.: "Mental Deficiency (Amentia)." London: Bailliere, Tindall and Cox, 1908. 10s. 6d. net. "Amentia: Etiology, Classification, Pathology," Archives of Neurology. Edited by F. W. Mott. Vol. ii., p. 328. London: P. S. King and Sons, 1903.

Warner, F.: "Report of the Scientific Study of the Mental and Physical Conditions of Childhood." London: Royal Sanitary Institute, 1895. 2s. 6d. "Report on the Feeble-Minded." London: Sonnenschein for Charity Organisation Society, 1893. 2s. 6d.

XIV

SCHOOL CLINICS

BY

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THE diseases and abnormal conditions which are revealed amongst our elementary school children by medical inspection are many and varied, and it is astonishing how great a proportion of them are in urgent need of skilled medical or surgical advice, and further, how great a number of them are still neglected, though the parents of such have received advice from school medical officers urging them to obtain immediate attention to the conditions found.

It is the practice of the present-day school inspector, after having discovered any defect in a child, to notify the parent of that child of the fact, and at the same time to advise that the child should be taken to a doctor for examination and treatment. Intelligent parents follow this advice in many instances, but many parents take their children to a doctor only when the disease is very strikingly apparent, and probably on account of the expense, the majority of those suffering from so-called trivial complaints, such as scurfy head, adenoids, and running ears, are absolutely neglected.

Whatever the reason may be, there is little doubt that certain abnormal conditions amongst school children have in the past been very inadequately attended to. It may be owing to carelessness on the part of the parents, who never seek medical advice at all, or having sought medical advice, to a lack of perseverance in carrying out the prescribed treatment. Sometimes, perhaps, the treatment

itself, as prescribed, is partly or wholly inadequate to cure the condition.

The parent of a child who has been found to have some physical defect has nowadays a great choice of agencies whereby he may obtain medical advice and treatment: (1) The private practitioner; (2) the infirmaries, or children's hospitals; (3) the eye, ear, and other special hospitals; (4) dispensaries; and (5) Poor Law medical relief agencies.

School Diseases.

In spite of all these facilities for medical treatment, many of them at no cost whatever to the parent, there exist and persist in our elementary schools some conditions upon which no impression has yet been made, and for which therefore it may be assumed there is not in existence the necessary provision.

These conditions which, on account of their serious effect upon the attendance and efficiency of our schools, might well be included along with certain infectious diseases under the term "School Diseases," are as follows: Ringworm; sores of all kinds: sore head, impetigo, scabies; ear discharge; defective vision: sore eyes and eyelids; and defective teeth.

These are the conditions which appear to have been neglected, or inefficiently treated, or both, and the treatment of which is now being catered for in several towns by means of school clinics.

The treatment of ringworm and other skin diseases, otorrhœa, and defective teeth, is necessarily very long and tedious, and requires the greatest perseverance on the part of the doctor or dentist, and the parent of the child affected. If obtained from a private practitioner the treatment would be far too costly for the great majority of elementary school cases.

The hospitals and dispensaries have neither the time nor the staff to cope effectually with these diseases. For defective vision, it must be admitted, there are the eye hospitals, but the primary functions of these institutions is not the "correction of errors of refraction," which, if

sent there, would flood the out-patient departments; and further, experience has proved that in spite of many notices sent to parents regarding defective vision, few children have been taken to the eye hospitals. No doubt the small number who have received treatment in the past may be attributed chiefly to carelessness on the part of the parents.

Medical inspection, with its discovery and diagnosis of disease, and the advising of parents to obtain the requisite treatment, is, of course, an excellent thing, but so far as some diseases and some parents are concerned, the matter usually stops there. The cases are diagnosed and the parents advised, and then—in the great majority of cases —nothing more.

Medical supervision of school children has here its weakest point. Those very diseases which chiefly affect our scholars, and which play such havoc with our school efficiency and attendance, are the most neglected by parents in spite of medical inspection, and it is here, therefore, that we claim the school clinic is the one, the only, and the best method of dealing with the difficulty.

The Organisation and Administration of a School Clinic.

As an education authority we obtain information of physical defects first hand, having given the necessary advice to the parents, we are able through the teachers, school nurses and attendance officers, to ascertain whether the children have, or have not, been placed under treatment. We have power to exclude from school all children who are considered by us to be unfit for attendance, until the condition present is remedied.

All excluded children, wherever under treatment, are reported upon weekly by the attendance officers. Those who attend the school clinic are not lost sight of until cured. Their regular attendance is assured by frequent visits from the attendance officer. We can offer treatment which, if obtained from a private doctor, is absolutely out of the reach of most people on account of its cost—for

instance, the examination of eyes and prescribing of spectacles, X-ray treatment of ringworm, and the daily treatment of otorrhœa.

Experience teaches us that some pressure must be brought to bear on a large number of parents in order to ensure that attention is given to the popularly called "trivial affections" of childhood. It is useless our urging parents to obtain medical treatment and excluding their children from school if there be no adequate provision for such treatment, and the necessary amount of pressure required in order to obtain this treatment can only be applied by a carefully considered administration on the part of an education authority, who at the same time can offer adequate provision for treatment. It is this administrative power that makes the school clinic so much more efficient and adequate than any other scheme which has been proposed up to the present.

Under the term "treatment" there are many grades, from an arrangement whereby a school nurse deals with ringworm cases or sores, or where vision only is dealt with, to a fully equipped school clinic.

Many authorities have already appointed school nurses, who visit the homes of the children with a view to encouraging and persuading parents to obtain medical attention to certain defects, and in some instances to carry out some degree of treatment. In this connection it is very clearly set out in the Annual Report for 1908 of the Chief Medical Officer of the Board of Education that "the Board have considered it important that the school medical officer's supervision of the nurses should be effectively guaranteed, and where such schemes have been sanctioned it has always been on the understanding that the nurse will act under the supervision and authority of the school medical officer." Several authorities have received the sanction of the Board of Education and have now made arrangements for the prescribing and providing of spectacles.

School clinics for the treatment of certain diseases have already been established in some areas—Bradford, Bow,

York, Brighton, Sheffield, Southampton, etc., and a dental clinic at Cambridge.

The Bow clinic is a voluntary agency. It is carried on in one of the schools in the district. The staff consists of two medical officers (part time) and a nurse, who syringes ears and applies dressings, lotions, etc.; she also visits the homes of the children and advises and assists in carrying out the treatment recommended by the medical officers. The conditions treated are otorrhœa, defective vision, sore eyes, skin diseases, anæmia, debility, and tuberculosis.

The Cambridge Dental Clinic, which was established in 1907 by the generosity of a member of the Education Committee (Mr. Sedley Taylor), has been taken over entirely by the local authority, and is now doing a splendid work. The Chief Medical Officer of the Board of Education, in his Annual Report, 1908, makes the following reference to the Cambridge clinic: "The Board have viewed this experimental dental clinic with great interest, not only on account of its own merits, but as an attempt to meet what is admitted on all hands to be a pressing need, namely, the appropriate treatment of the widespread evil of decaying teeth in school children. The importance and gravity of the question cannot be doubted." The Cambridge local authority in considering the advisability of taking over the dental clinic arrived at the conclusion "that dental disease is terribly prevalent, that it is productive of serious and lasting evil to health, and that there is no hope that it can be dealt with by private practitioners."

Many of the large German cities have seen fit to establish school dental surgeries for the examination and treatment of the teeth of children attending elementary schools. In Strassburg there is a staff of three whole-time dentists, who, besides treating the children's teeth, visit the schools and instruct children as to the importance of cleanliness, and make an important feature of lecturing to teachers on the subject of school hygiene, so that they may impart it to the children. This work is supplemented by large dental charts which are hung on the walls of the school-rooms, and cards or circulars containing instructions

regarding the care and preservation of the teeth are distributed among the scholars.

Since the opening of the dental clinic in 1902 no less than 157,000 children have been examined. The institution is provided and supported by the municipality. Dr. Jessen, the Chief Dental Surgeon of the Strassburg Clinic, makes the following statements, which are based on his very considerable experience of school children: (1) The greater the amount of dental disease, the worse the physical development of the child: (2) the worse the condition of the child's teeth the worse were its school reports; (3) that in no department of public health can such far-reaching results be obtained with moderate expense.

Probably one of the best equipped school clinics at present in existence in this country is the one at Bradford. At present there is no provision for the treatment of defective teeth other than that kindly supplied free of cost by Mr. North, the chairman of the Canteen Sub-Committee, for those children only who attend the Open-air School. The Committee have, however, at present under consideration the question as to the desirability of appointing a whole-time school dentist, and it is hoped that in the near future a dental department will be added to the existing clinic.

The Functions of the School Clinic.

The routine work of a well-organised and skilfully managed school clinic may be thus summarised:—

1. Careful and thorough examination of cases referred from medical inspection in the schools. Many cases cannot be definitely diagnosed in the time usually allowed at a school inspection, and these are sent for to attend the clinic, where sufficient time can be given in order to form a sound opinion upon them. Each child is thoroughly overhauled, and the parent, who usually attends also, is advised, when necessary, to obtain medical treatment. An opinion is also given in reference to attendance at school or otherwise. A great number of these cases are in a very delicate state of health, and they are kept under observation by an occasional visit to the school clinic.

2. Children who are "ailing" or "delicate" are brought by their parents on their own initiative, or at the suggestion of a teacher or attendance officer, to seek advice as to their fitness or unfitness for school attendance, and such advice is given after an examination has been made.

3. For the selection of children for open-air school treatment.

4. The examination of suitable cases for admission or transference to and from mentally defective, blind, and deaf schools.

5. The control of infectious diseases, which includes the inspection before re-admission to school of all children who have been suffering from scarlet fever or diphtheria, and of all children of school age from a house where there has been a case of diphtheria, and the carrying out of a bacteriological examination of the throat in all cases of diphtheria and contacts, and occasionally in scarlet fever cases.

6. The treatment of certain specified conditions, namely, ringworm, impetigo, scabies, ear discharge, dirty and sore heads, defective vision, and "sore" eyes. These conditions, and these only, are treated at the Bradford Clinic; moreover, only those cases which are known to be under treatment by no other medical man, either privately or at an institution, are taken in hand.

The staff of a well-equipped school clinic will probably consist of a medical superintendent, two assistants, two nurses, and two clerks. All these officers are employed in connection with medical inspection as well as clinic work.

The accommodation consists of:—A large general waiting room with seating accommodation for 150 persons, a waiting room for children who come up for inspection and examination previous to readmission to school after an attack of scarlet fever or diphtheria, and for diphtheria contacts, medical superintendent's room, which is also used as a consulting room, two consulting rooms for assistant medical officers adjoining large waiting room, room for the use of the nurses, clerk's room, an

eye-testing room containing two cubicles fitted up for retinoscopy, an ear room, in which children suffering from otorrhœa are treated daily by syringing, etc., and in which the heads of children who require it are shampooed, a ringworm room for the preparation of cases for and after treatment by X-rays, an X-ray room, a bacteriological room, containing an incubator for diphtheria cultivation, a hot air steriliser for making swabs, and the other necessary apparatus for microscopical examinations of specimens of various kinds.

The school clinic is fed from various sources:—

1. By the school medical officers who discover cases during routine inspection in the schools.

2. By school nurses when examining children in school.

3. By teachers, who exclude from school all scholars suffering from infectious or contagious disease; such cases being notified to the medical superintendent.

The cases are watched and reported on by the attendance officers; notice is sent to the attendance officers of all irregular attenders at the clinic, and a visit to the house by one of the officers usually suffices to procure due attention to the matter.

A reference to the programme for the week of the Bradford School Clinic will serve as a convenient model:—

Monday and Tuesday.—Examination of cases of defective vision and the prescribing of spectacles—each of the assistant school medical officers working alternately for half a day, the remaining half of the day being spent in the schools. Each case is seen by appointment made with the parents, and after being examined is referred to the optician, who supplies spectacles by contract with the education authority, to be measured for frames, and another appointment made for a week hence. The prescriptions are handed by the doctor to a clerk, who forwards them to the optician, and the spectacles when ready are delivered at the education offices, where they are placed on the children by the doctor who examines them, and the vision tested.

Except in those cases which on inquiry prove to be

unable to afford it, the parents pay the price of the spectacles. The latest figures show that about 75 per cent. of the spectacles provided are paid for.

Wednesday and Saturday Mornings.—General clinic for the examination and treatment of various skin diseases, and examination of cases referred from inspection in schools: cases referred by teachers, nurses, or attendance officers: children who require examination before admission to blind, deaf, mentally defective or open-air schools.

Wednesday Afternoon.—Ear clinic for the weekly examination and treatment of cases of otorrhœa, and the examination of children suffering from deafness—and the cases of otorrhœa also come up daily in order that the treatment prescribed by the doctor may be carried out; this is done by one of the school nurses.

Thursday and Friday are devoted to routine inspection in the schools by the assistant school medical officers.

Children who have had scarlet fever or diphtheria, or who come from a house where there has been a case of diphtheria, are examined by the medical superintendent on Thursday and Friday. The two diseases are sent for on different days and the waiting-room disinfected and thoroughly scrubbed out each evening.

The throats of all cases of diphtheria and contacts and of suitable cases of scarlet fever are swabbed and examined bacteriologically, and the children are not readmitted to school until free from infection. Scarlet fever cases are not readmitted to school until free from desquamation, rhinorrhœa, and otorrhœa.

X-Ray treatment of ringworm is carried on each day with the exception of Saturday.

The school clinic is an institution suited to and demanded by the conditions prevailing in urban districts—in rural districts it is probably quite impracticable. In some of the country districts in Germany "flying clinics" have been instituted for the treatment of defective teeth. After inspection by the school medical officer, a dental surgeon pays a visit to each school and treats the children who have been found to require his services. This method

of treatment could easily be extended so as to include other conditions such as defective vision and otorrhœa.

The matter of treatment of defects in school children has received special consideration in London, and a report by a special sub-committee of the London County Council Education Committee was made in December, 1908. The committee was composed of educationalists, general medical practitioners, and consultants, governors of hospitals, and representatives of other bodies. On the grounds of efficiency and economy the committee recommended:—(*a*) That, as the existing provision of private and hospital practice sufficiently meets the requirements in the case of children requiring operative and in-patient treatment (who are thus removed from the direct purview of the education authority) no further steps be taken in respect of this class. (*b*) That the Council should establish school clinics at suitable centres in the Metropolis for the medical treatment of certain defects, namely, those who can be promptly and adequately dealt with in suitably equipped rooms, *e.g.*, children suffering from teeth defects and simple diseases, eye defects and simple diseases, skin diseases (chiefly parasitic, ringworm, scabies, and pediculosis), ear defects and simple diseases.

The advantages of the school clinic are summarised by Dr. Crowley[1] as follows:—"(*a*) It ensures the treatment of conditions in children which, up to the present, have been largely neglected. This applies with especial force to such conditions as ringworm, running ears, sore eyes, sore heads, etc. (*b*) It is enabled to ensure such treatment because it lays itself out for this purpose, its concern being to see that the child is cured as quickly as possible, not only for the sake of the child's physical health, but also for the sake of the other children in the school, and of the school attendance of the child. (*c*) It can bring the necessary machinery to bear to ensure that no child suffering from such conditions as mentioned is left untreated, and the child being once under treatment, the necessary

[1] Annual Report to the Bradford Education Committee, 1908.

steps can be taken to ensure regularity of attendance. So far as concerns the physical defects and diseases mentioned, the school clinic reduces the possibility of parental neglect to a minimum. (*d*) It greatly adds to the interest of the school medical officer, and makes him or her correspondingly more efficient, and greater value, from every point of view, is obtained for the money spent on medical inspection. (*e*) In addition to the above general advantages, the school clinic has special advantages in the case of each of the conditions for which it has been established."

Alleged Objections to School Clinics.

The chief objections to school clinics are purely theoretical—the policy of the economist is decidedly short-sighted, for efficient medical treatment is certainly followed by more efficient educational results, and more perfect conditions of health—and the children become, even financially, of more value to an education authority. The neglect to provide a practical scheme for treatment of defects in school children results in the production of individuals who ultimately become entirely chargeable to the State as inmates of workhouses, hospitals, prisons, and other institutions.

Objection is also raised by general medical practitioners. In the past, at any rate, they have proved themselves unequal to the task of keeping the children in good health. This has probably been due to some extent to neglect on the part of the parents, but there has also been some fault on the part of the doctors. Dr. A. H. Hogarth,[1] in discussing the relation of the medical practitioners to treatment of school children in poor districts makes the following statement:—"Many members of the medical profession appear quite devoid of conscientiousness. They constantly certify children as free from infectious

[1] Hogarth, A. H.: "Medical Inspection of Schools," p. 231. London: Henry Frowde and Hodder and Stoughton, 1909. 6s.

and contagious disease, and as fit to attend school, when they are obviously suffering from ringworm or scabies, and sometimes even in diphtheria their action is not above suspicion. For example, out of 240 certificates of freedom from ringworm no less than 234 were proved to be inaccurate on microscopical examination of specimens from the affected cases."

In support of the view that school clinics do not actually interfere with the work of the general practitioner, I would quote from a report made to the Ashton-under-Lyne Division of the British Medical Association by a Committee appointed by that division to consider the question of the treatment of school children found on examination to be defective. The Report states that the Committee visited the Bradford Clinic, and had the question of the advisability or otherwise of school clinics explained to them by the Medical Superintendent, and by the Chairman and Secretaries of the Bradford Division of the British Medical Association. Among other conclusions arrived at one reads as follows:—"Your Committee consider that the School Clinic, as carried on at Bradford, has not hitherto proved detrimental to the interests of the practitioners of that district."

Lastly it has to be argued that the School Clinic is liable to abuse—this objection applies to any method of medical treatment, and cannot be said to be more true of school clinics than of any other scheme that has been suggested.

The School Clinic is merely a part of a huge machine whose function is the betterment of the physical and educational condition of our school children, and the provision of timely and effective treatment for many children who are hopelessly neglected and handicapped. With it there is the possibility of tremendous benefit to our future citizens and to the State: without it, a continuance of the deplorable condition of physical inefficiency which exists among the children.

REFERENCES.

For full details regarding the establishment of School Clinics reference should be made to the following:—

BRIDGE, J. C.: "Fourth Annual Report on the Medical Inspection of School Children in Dunfermline." Dunfermline Carnegie Institute, 1909.

CROWLEY, R.: "The Treatment of School Children," in "The Hygiene of School Life," Chapter X., p. 160. London: Methuen and Co., 1910. 3s. 6d.

HOGARTH, A. H.: "Medical Treatment at School," in "Medical Inspection of Schools," Chapter XIV., p. 209. London: Henry Frowde and Hodder and Stoughton, 1909. 6s.

KERR, JAMES: "Annual Reports to the Education Committees of the London County Council, 1904-1909." London: P. S. King and Son. 1s. 6d. each.

NEWMAN, GEORGE: "Annual Report for 1908 of the Chief Medical Officer of the Board of Education." Section IV.: "Action taken by Local Education Authorities in Respect to Medical Treatment," p. 85. London: Wyman and Sons Ltd., 1910. [Cd. 4986.] 8½d.

See also last Annual Reports of the School Medical Officers for Birmingham, Bradford, Dundee, Halifax, Manchester, Salford, and other large towns.

XV

THE FEEDING OF THE SCHOOL CHILD

BY

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FOR the last thirty years increasing attention has been given to the needs of the school child, and the problem which concerns the feeding of the young citizen in training still remains in great measure unsolved.

HISTORY AND LEGISLATION.

The existence of the many voluntary associations for the provision of free meals and the reports of the Royal Commissions (1903-1905) afford conclusive evidence of the extent to which the need exists. The social conditions under which the poor exist in large towns, unemployment, intemperance, and female labour are the dominant casual factors.

The problem is most urgent in manufacturing districts, with their large child populations, the close aggregation of the poor, and seasonal and cyclical variations in trade. Estimates of the number of children requiring free meals vary; the percentage has been placed at thirty-three by Dr. Leslie Mackenzie in Scotland, sixteen by Dr. Eicholz in London, ten to fifteen by Dr. Macnamara, and two by Dr. Kerr. This variation may probably be accounted for by lack of distinction between the " underfed " and " ill-fed " child; the one below the true standard by actual lack of food, the other by reason of incorrect feeding, deplorably common among the poorer classes, both in urban and rural districts.

A fairly correct estimate of the percentage of children suffering from under-feeding and requiring free meals would be from two to five per cent. in large towns. The evil undoubtedly is often limited and spasmodic, especially in manufacturing towns; trade variation accounting for this.

The factor of compulsion in elementary education carries with it certain responsibilities. One of these is that the condition of the child shall be, if possible, such that he will obtain full advantage from his education. The underfed child cannot do so; hence from the economical and moral point of view it is only reasonable to provide him with food.

The first organised attempt to deal with the problem was the institution in 1879 of *Cantines scolaires* in Paris by the Préfecture de la Seine, the administration in each arrondissement being delegated to the Mayor and Committee of the *Caisses des Écoles*. The movement was in full swing in 1884, and the work has increased steadily ever since.

In England the pioneer of the movement was Canon Moore Ede, of Gateshead. The example thus set was rapidly followed in Birmingham, under the guidance of Dr. Airy.

During the last twenty-five years, in almost all large towns, voluntary associations have undertaken the work; the administration varying with the particular needs of the district.

Rapid advance followed the publication of the reports of the Royal Commission on Physical Training, Deterioration, and that of the Interdepartmental Committee on Medical Inspection and the Feeding of Elementary School Children. Each report contained a recommendation that definite provision should be made for dealing with this problem.

The arguments against the sole use of voluntary associations are, firstly, that financial support is precarious and incapable of meeting large fluctuations in the demand for free meals; secondly, the system is liable to abuse, in that there is no statutory power to institute inquiries

among parents or to recover the cost of meals supplied or to punish neglectful parents (except by action through the N.S.P.C.C.); and thirdly, there is no recognition on the part of the local authority to make arrangements at the schools for the feeding of children. Moreover, through lack of funds in summer, children can be only fed in the winter months, although some children are undoubtedly underfed throughout the year.

The movement first received legal recognition in the issue of the Relief (School Children) Order, 1905, by the Local Goverment Board. Under this order certain provisions of the Poor Law were adapted to the relief of elementary school children in a state of destitution from want of food; such cases being reported by officers of the education authority to the Board of Guardians (procedure under Circular 527 of the Board of Education). The result of the adoption of this order in most places was a rapid diminution in the number fed, owing to the procedure of investigation.

The present stage was reached in the introduction of the Education (Provision of Meals) Act, 1906. The Report of the Select Committee on this Bill conclusively proved that further action was necessary. The chief points of this Act, which came into force on December 21st, 1906, are as follows:—

1. The education authority may associate with themselves the committee of any voluntary feeding association, and may provide buildings and officers to assist in organisation, or preparation of food.

2. The cost of the meals is recoverable summarily from the parents where necessary.

3. In certain cases the education authority may defray the cost of food from the rates, by application to the Board of Education, who may authorise the spending of a certain sum not to exceed the amount produced by a halfpenny rate in the pound.

4. The provision of meals to a child does not disfranchise the parent.

5. The aid of teachers to be optional, not compulsory.

The administration of the Act is explained in Circular 552 (1907) of the Board of Education; further references are made in Circulars 576 and 596 (1908).

The arguments against the provision of free meals from the rates are based on the removal of parental responsibility and the diminution of voluntary effort which usually accompanies any rate-aided scheme. Both these objections are dealt with in the Act. The advantages of the adoption of the Act lie in the systematisation of investigation and administration by the local authority, and in the power to recover money from parents. The adoption of this Act is permissive. An attempt to render it obligatory was rejected in 1909.

Organisation and Administration.

The first step is the adoption by the local authority of the Education (Provision of Meals) Act.

If, the voluntary funds being insufficient, a grant is required from the rates, the education authority must pass each year a resolution that there exist in the schools children unable by lack of food to take full advantage of the education provided. The Board of Education will then authorise the spending of a definite sum (on food) with the limitation mentioned in the previous section. A canteen committee, comprising members of the education authority and of voluntary associations for the provision of meals and of the N.S.P.C.C., should be formed. To this committee is entrusted organisation and selection of suitable children.

Nomination of children may be through head teachers, attendance officers, school nurses, health visitors, or the medical officer. The majority will come through the teachers, who should exercise due discrimination. They should have personal knowledge of the children nominated and their circumstances, and should not recommend entirely by personal appearances, often unreliable. Home inquiries are then made by the attendance officers, on a special form, stating total wages, number in family, etc. (*vide* model form). The particulars on these forms should

Meals { Granted / Refused

.....weeks to.....

.....weeks to.....

.....weeks to.....

.....weeks to.....

.....weeks to.....

.....weeks to.....

No.....

BRIGHTON EDUCATION COMMITTEE

SCHOOL CANTEEN ENQUIRY FORM.

Name.....

Address .....

Names of Children attending School.	Age.	School Attending.	Dept.	Result of Medical Examination.

No. of Children not attending School, and ages. ( )

Names of Parents, also of each other member of family above 14 years of age.	Age.	Occupation.	Name and Address of Employer or last Employer.	Weekly Wages.

Total No. in Family residing at home, including Parents.....

Rent of House or Tenement.....

Do Parents let ?..... If so, state Weekly Income from this source.....

Any arrears of Rent ?..... If so, state amount..... Did Officer see Rent Book ?.....

Are Parents in receipt of Out-Relief, Pension, Sick Pay, etc ?.....
If so, state weekly amount.....

If Parent(s) out of work, how long ?.....

If Parent(s) unable to work, state reason.....

Name of Person supplying this information.....

Officer's Remarks as to character and habits of Parents :—

Is Officer satisfied that this case is deserving ?.....

Date..... .....Attendance Officer.

SECOND REPORT. Date of Visit.....

THIRD REPORT. Date of Visit.....

FOURTH REPORT. Date of Visit.....

REQUISITION FOR MEALS.

To be signed by Parent or Guardian.

I hereby request that Meals may be supplied to my child(ren), under the Education (Provision of Meals) Act, 1906, at the School Canteen, and hereby certify that the particulars given to the Attendance Officer, as entered on this Form, are correct.

(Signed).....
Parent or Guardian.

Date.....

be periodically revised. The school doctor should examine all cases and attach his recommendation to the form where necessary. The forms are then sent to the committee, who investigate each case and select the children to be fed. Selection should be made on the following indications: From the total weekly earnings of the family the weekly rent is subtracted; the residual income is divided by the number of adults in the family (two children under 14 count as one adult). If this leaves 3s. or under per head, the children should be fed free. A system of this kind is used in Manchester, Brighton, and other places, and has been found to work well. Cases recommended by the school doctor should be fed, payment being requested if necessary.

Admission to the canteen should be by tickets distributed by the teacher; no distinction should be made between paying and non-paying children.

The canteen should be a room near the school, or a room in the school not in general use for teaching purposes. The school hall may generally be used. A large kitchen should be attached to the main centre; from here food may be distributed to subsidiary centres, thus avoiding multiplication of utensils, fires, and cooking assistants. Trestle tables and forms are in general use. They are quickly removable. Rooms should be well ventilated, light, and clean, since stress is laid by the board on the use of these centres as places for training the children in punctuality, cleanliness, and good behaviour. Supervision should be exercised by means of voluntary lady helpers acting as managers. The use of flowers and table-cloths has been suggested as a means of brightening the limited mental horizon of these children. If these can be provided voluntarily this should be done. The register should be kept by an attendance officer.

The above scheme gives the necessary organisation in a large town. If a few only in one district require feeding it is more satisfactory to arrange for the meals to be given at a small restaurant. In large towns, however, it is more

economical for the local authority to provide for the cooking and service.

The use of cookery centres for preparing the meals has been much discussed. It is generally held that if the provision of meals is on any large scale it is impossible to utilise the centre or the services of children attending there.

The requirements of the Code prevent the latter, and if so used the scientific teaching of cookery would be at an end, unless much more time than is practicable were devoted to it. Such centres, however, may be used for providing dinners in special schools; the cooking being chiefly carried on by a special assistant and not interfering with the class teaching.

In rural districts the problem is rarely pressing, and can generally be met by voluntary assistance, with the use of the school-rooms and furniture. It is usually a matter of convenience, owing to the distance children have to travel, rather than of urgency.

The provision of free meals during vacations and on Saturdays has been held to be *ultra vires*. In such cases the authority may be surcharged, hence assistance given at these times must be from voluntary funds; the organisation, however, may remain the same.

Other problems suggest themselves—the provision of meals throughout the year, and the nature of the meal to be given. Winter is undoubtedly the period during which lack of food is most general, and is most felt. The pulse of the subscribing public is known to vary with climatic conditions. The demand is much less in summer; nevertheless, the organisation in any large centre should be elastic enough to deal with the provision of meals throughout the year.

The much discussed problem of "breakfast or dinner" has led to considerable diversity of opinion. The balance is in favour of dinner. Children can generally obtain a breakfast, whereas a reasonable dinner is often not forthcoming. Breakfasts cost less, are easy to arrange for, and the neediest only are likely to attend. The school session

following breakfast is also longer than that after dinner, hence if there is much poverty in the district it would be advisable to provide a breakfast also. Generally, however, dinner is the better meal, if one only can be given. Dr. Hutchison has expressed the opinion that the period of the day at which the meal is given is immaterial.

One other problem the committee will have to face is that of providing meals for the starving only, or for those who can pay also. They should provide for both, and should enforce payment where it can be made. The advantage, in the latter case, to the parents, both of whom are often out at work, counterbalances the so-called "breaking-up of domestic life." In any case the latter would exist. The parents would continue at work, the child being given a penny to purchase a dinner; the money would be spent on a bun and sweets, instead of a wholesome meal supplied at the canteen. Payment, when it can be made, should be prior to the meal.

The Work of the School Medical Officer in Relation to School Canteens.

This has been incidentally mentioned above. All children receiving free meals should be examined. Height, weight, nutrition, evidence of disease should be noted (preferably on a special card), and a recommendation sent to the committee if necessary.

Measurements should be compared with a local standard. It is advisable to compile a local table of the relation between height and weight, and to select children for feeding if they fall below the weight standard for their height. This affords a better index generally of nutrition than the comparison of height and weight with age-standard height and weight.

Children with tuberculosis or rickets should be recommended from a prophylactic point of view. It is often advisable to recommend all members of a well-known tuberculous family, irrespective of their stature.

A careful distinction should be made between cases of nutrition due to disease or mal-feeding, and those due to

insufficient feeding. Collateral evidence from reports of attendance officers will often be necessary.

Periodical measurements should be taken during the period the meals are given. Useful information is thus obtained. Reports should occasionally be made to the committee on the results obtained.

The food materials and methods of cooking should be investigated by the medical officer, and he should be prepared to report on contract samples of foods.

Dietaries.

The drawing up of a menu should be left to the school doctor. The meals should be easily cooked, economical, satisfying, and calculated on scientific principles. The amount of the foods, digestibility, and relative proportions of their proximate principles (proteid, carbohydrate, and fat) should be known, with their value calculated in calories (*vide* any standard work on dietetics).

Important points to be borne in mind are the following: A child requires proportionately more food and more proteid than an adult, and if possible a liberal allowance of fat should be made, as this is always lacking in the food of the poor. Children between 6 and 12 years require 50 to 60 per cent. of the food supplied to an adult doing average hard work—*i.e.*, the fuel value should be 1,500-1,800 calories per diem (proteid, 80 grains; fat, 30 grains; carbohydrates, 290 grains 1,800 calories). Of this total, the amount supplied by a canteen dinner should be from one-half to two-thirds—*i.e.*, equivalent to 900-1,200 calories, as an average per child.

In practice it is very difficult to provide economically the relative amounts of fat and proteid given above. One has to resort to the vegetable proteids of peas, lentils, and beans; these are less digestible than animal proteids, the food is bulky, but this is hardly a disadvantage to an ill-fed child.

Palatability is distinctly increased by giving a different soup daily. Several soups may figure on the daily menu, so that the child may have a choice. Irish stew is an economical and popular dish.

Fat is supplied in the form of margarine, dripping, and suet puddings; carbohydrates as bread, potatoes, rice-pudding, or porridge. Currant bread is well appreciated, and has a higher food value than ordinary bread.

The following gives a suitable menu on the above lines:—

Monday - - -	Irish stew. Bread.
Tuesday - - -	Currant or raisin suet pudding. Bread and jam.
Wednesday - -	Haricot or pea soup. Bread.
Thursday- - -	Lentil soup. Bread.
Friday - - -	Currant bread and margarine. Bread, margarine, and banana or jam.
Saturday - - -	Haricot beans with dripping. Bread.

The above menu may be provided at a cost of .7d.-.9d. per meal for food, and at a total cost (including administration) of 1½d.-2d.

In Paris, three-course meals of soup, meat (ragôut), and vegetables are supplied at a cost for food of 15c. to 18c. (1½d. to 1¾d.). Soups for infants are made with milk and finely chopped meat.

In special schools, supplied from a cookery centre, an admirable dinner of meat soup, roast or boiled meat or fish, and some pudding may be given at a cost of 1½d. for food, and an extra 1d. for service—*i.e.*, 2½d. in all.

Vegetarian meals, consisting of vegetable soups, brown bread, and nucoline puddings have for years been supplied in East Lambeth at a total cost of 1d.

In Birmingham (1905) the meals consisted of lentil soup, and bread and jam, supplied at a cost of ½d. per head=(cost of food plus £150 as salary for manager)—a triumph of administration not to be attained in many towns.

In order to provide suitable means therefore, the authorities must generally be prepared to spend from ¾d.

to 1½d. in food material, and from ¾d. to 1d. in administration—*i.e.*, from 1½d. to 2½d. per meal.

It may be taken as a working rule that the better the meal the stricter should be the necessary supervision as to payment.

The Movement in England at the Present Day.

In London and in the larger provincial centres the problem has long received recognition and practical measures have been adopted, the funds being supplied from voluntary sources, or from the rates by the adoption of the Provision of Meals Act (since 1906). In London, in 1907, a special sub-committee of the Education Committee decided that the necessity of the case could be met by voluntary funds. The Council supplied equipment, and the details were carried out locally by the Children's Care Committees. In most instances dinner is given, but in a few districts breakfast. At the present time, however, the Provision of Meals Act is now in operation in London.

Manchester adopted the Act, and the education authority now supplies dinners at a cost of 1d. per child. A central depôt is used for cooking, and meals are conveyed by milk carts to the seven dining centres elsewhere. A gradual scale of income is used in ascertaining the needs of the family.

5 or more in the family	...	2/6 per head
3 or 4 in the family ...	...	2/9 per head
1 or 2 in the family ...	...	3/- per head

The school medical officer examines all children requiring the meals.

In Liverpool the Act has not been adopted, coupons available at certain dining-rooms being issued to the children after investigation has been made by the Canteen Committee and their officers.

Birmingham now supplies a breakfast in place of the soup dinner of previous years. It consists of bread and margarine, or jam, and milk cocoa, and is served in the schools at 8.45 under the supervision of the caretaker. The Act was adopted in 1907.

In Bradford dinner is provided at a cost of 2d.; the teachers help in the work, and are paid 5s. per week for this assistance. A two-course dinner is given of meat, vegetables, fish, or soup. The scheme is very thorough both as regards administration and organisation.

In Leeds and Newcastle dinners are provided at a cost of 2d. The Act has been adopted in both places. In Leeds, Sunday schools are used as dining centres, and the meals are supplied by a caterer.

In Brighton the scheme is under the direction of a canteen committee, with an investigation branch committee which deals with all cases, reports being furnished by attendance officers and the school doctor. The total cost for administration and food is 1½d., and from 5 to 8 per cent. of the children are fed.

In rural districts very little is done at present; voluntary agencies on a small scale suffice to meet the needs of the underfed in a rural school.

The School Canteen Abroad.

The movement for the feeding of school children has made great strides in Paris since its inception in 1884. At present about one-third of the parents pay partially or wholly for the meals. The tendency in Paris is more and more towards the total abolition of all parental payments; this is after twenty-five years' practical experience of the experiment on a very large scale. The dietary has become larger and of a better quality of late years—*i.e.*, the cost of the meal has risen. A great point is made of the refining influence of the meal on the manners of the children; in many schools the teachers dine with the children. The methods of cooking and of service are excellent and might well be copied in our own country.

In Marseilles about 10 per cent. of the children attend the canteens; the preparation of the meal is an object-lesson in the provision of economical but appetising and refined dishes at a cost of 1½d. per head.

In Toulon, a large industrial centre, the canteens are controlled by the municipality, the details of organisation

being left to the school authority. The abolition of congregational schools has materially altered the position of late, and there can be no doubt that a considerable extension of the *cantines scolaires* will be necessary.

In Nice all children in the maternal schools are fed, no investigation being made, or payment demanded.

In Mentone the authorities have decided that all new schools shall have kitchens attached with the necessary means for feeding the children.

The percentage of the parents who pay for the meals in France is far greater than in England; this is doubtless due to the freer use made of the canteens by the better class grade of children.

In Italy a good deal of attention has of late been paid to this problem. In one town, Vercelli, there exists (1906) a system of free and compulsory feeding for the children. This communal mid-day meal is used as a means of educating the children in the duties of citizenship. Rich and poor alike are compelled to attend; a medical certificate is required from those failing to attend. The whole policy of education in this township is based on truly Fabian lines.

At San Remo, Milan, and other places the problem is energetically dealt with; the food provided—chiefly bread, salame (a form of sausage), macaroni in various preparations)—is not so good as that given in France, but the range of the menu will doubtless be increased in the future.

In Brussels, one out of every five children receives some food; in the Borough of Anderlecht a free mid-day meal is provided for all, the better class being expected to pay 2d. per meal, thereby to some extent paying for the poorer; the balance is provided by the municipality.

In Germany there is generally no central organisation. The funds are obtained from voluntary sources or from municipal grants; no State aid is given, except in Baden. The meals are given in schools or restaurants, and in some places may be taken home by the children; the cost is from 1d. to 2d.; dinner generally is given. In Munich the free feeding is continued during the holidays.

In Denmark (Copenhagen) the meals are provided from municipal grants and are given during winter months. There is no inquiry, and about 33 per cent. of the elementary school children receive these meals. The approximate cost (1904) was £2,400.

In Austria and Hungary much the same conditions obtain as in Germany. The poor only are fed, and no payment is demanded. In Vienna about 1,000,000 meals are given yearly, the cost being £4,600.

There is no provision made by the State in America for providing free meals (1906). Voluntary associations in New York and Chicago carry out what work is required sufficiently well to meet the demand.

In general it may be said that the tendency abroad is to provide meals for the children at the public expense with some voluntary assistance, to allow no hungry child to be without food, whatever the character of the parents, and to see that such meals as are given are of educational value to the children as regards preparation, economy, and tastefulness.

Financial Considerations.

A general estimate of the cost per meal for administration and food has already been mentioned. Under the Provision of Meals Act, the amount expended by the local authority on the food must not be more than that produced by a halfpenny rate in the pound. Hence any excess must be made up from voluntary subscriptions.

The total cost of feeding the children in London for the year 1909-10 is estimated to be about £60,000. The cost in Paris in 1904 of providing 9,000,000 meals, for which parental payment was made in a third of the cases, was about the same, £41,000 approximately being provided by the municipality.

In Milan the approximate cost for 1906 was £12,000. The annual cost in most English cities and towns is much less, owing to the stringent inquiries made before granting the free meals; in most places only the really underfed children are provided with food.

In Manchester (1907-8) the sum of £1,500 was granted for the provision of meals; in Liverpool (1907-8) about £800; in Bradford approximately £1,000 (October, 1907, to March, 1908); Birmingham, £2,000; in Brighton (1908-9) 113,500 meals were provided at a cost of £428 for food, £215 for premises and appliances, and £100 for cooking, etc., the total cost being £750.

It may be taken as an average that the *total* cost of providing free meals will be at the rate of about £7 to £8 per 1,000 meals provided.

The amount expended on food, service, and clerical assistance should be noted, so that the average cost of each meal for food and for administration may easily be calculated. The Board of Education requires information yearly on these points, and they are of great service in the calculation of future expenditure and the cost of any improvement of the dietary. (Circular 720, Board of Education, 1909.)

REFERENCES.

Further study of the subject of feeding of school children will be facilitated by reference to the following reports and works:—

The Report of the Royal Commission on Physical Training (Scotland), vols. 1 and 2. London: Wyman, 1903. 1s. 1d. and 5s. 1d.

The Report of the Inter-Departmental Committee on Physical Deterioration. 3 vols. London: Wyman and Sons, 1904. 6s. 9d.

The Report of the Inter-Departmental Committee on Medical Inspection and Feeding of Children attending Public Elementary Schools. Vols. 1 and 2. London: Wyman and Sons, 1905. 1s. 3d. and 3s.

The Report of the Royal Commission on the Poor Laws, pp. 834 to 840. London: Wyman and Sons, 1909. [Cd. 4499.] 5s. 6d.

The Report of the Select Committee on the Education (Provision of Meals) Bill, 1906. London: Wyman and Sons. [H.C. 288 of 1906.] 2s. 4d.

White Paper on Feeding of Children in Continental and American Cities. London: Wyman, 1906. [Cd. 2926.] 4½d.

Board of Education. Report on the Working of the Education (Provision of Meals) Act, 1906, up to the 31st March, 1909. London: Wyman, 1910. [Cd. 5131.] 3d.

Report of the Joint Committee on Underfed Children for 1906-7. The London County Council. London: P. S. King and Son, 1907. 6d.

The Free Feeding of School Children. Reprint. London: *Lancet*, 1907. 3d.

Report to the London County Council (Education Committee), 1908. Dr. Kerr, pp. 16 to 20. London: P. S. King and Son, 1909. 2s.

"Transactions of the Second International Congress on School Hygiene," 1907. Three vols. London: Royal Sanitary Institute, 1908. 12s. 6d.

Report issued by Edinburgh Charity Organisation Society on the Physical Condition of 1,400 School Children together with some account of their Homes and Surroundings. London: P. S. King and Son, 1906. 5s. net.

Among works dealing with dietetics and the feeding of children, reference should be made to the following:—

Alden, Margaret: "Feeding of School Children" in "Child Life and Labour." 2nd edition rev. London: Headley Bros., 1909. 1s. (Helpful bibliography given.)

Burnet, Sir R. W.: "Foods and Dietaries." A Manual of Clinical Dietetics. 4th edition. London: Griffin, 1905. 4s.

Crowley, R.: "Report on a Course of Meals given to Necessitous Children, from April to July, 1907." Bradford: Education Committee.

Emanuel: "A Child's Diet," Chapter in "Childhood." Edited by Dr. T. N. Kelynack. London: R. Culley, 1910. 1s. net.

Gorst, Sir J. E.: "Children of the Nation." London: Methuen, 1906. 7s. 6d. net.

Hutchison, R.: "Food and the Principles of Dietetics." London: Arnold, 1900. 16s. net.

MACKENZIE, LESLIE, AND MATTHEW, E.: "The Medical Inspection of School Children." Edinburgh: William Hodge and Co., 1904. 12s. 6d.

MACKENZIE, W. L., AND FOSTER, ALAN: "A Collection of Statistics as to the Public Condition of Children attending the Public Schools of the School Board for Glasgow, 1907." 10½d.

MCMILLAN, MARGARET: "Labour and Childhood." London: Sonnenschein, 1907. 3s. 6d.

SUTHERLAND, G. A.: "The Feeding of Infants and Children" in "A System of Diet and Dietetics." Edited by Dr. G. A. Sutherland. London: Henry Frowde and Hodder and Stoughton, 1908. 30s.

A useful bibliography will be found in "The Daily Meals of School Children," by Caroline L. Hunt, prepared for the United States Bureau of Education. [Bulletin, 1909. No. 3. Whole Number 403.] Washington: Government Printing Office, 1909.

XVI

OPEN AIR SCHOOLS

BY

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ONE of the many objects of a system of medical examination of school children is that each child should be provided with an educational curriculum suited to its mental and physical condition.

THE EVOLUTION OF THE OPEN-AIR SCHOOL.

When elementary education became universal it was soon found that certain children were, owing to such marked physical defects as blindness and deafness, quite incapable of benefiting from the ordinary curriculum of the schools. Consequently the Elementary Education (Blind and Deaf Children) Act was passed in 1893. This was followed in 1899 by the Elementary Education (Defective and Epileptic Children) Act, by means of which powers were given to local education authorities to establish schools for feeble-minded children and also for cripples, both types of child being obviously unfitted for ordinary school work. A class of children remained, however, the dull and backward type, for whom nothing had been done. This class was the subject of an investigation, carried out in Berlin and Charlottenburg, which was completed in 1903. The result showed that about 7 per cent. of the elementary school children were dull and backward, whilst of these one-half (or about 3 per cent.) were backward owing to such physical defects as the following: Anæmia

and malnutrition due to poverty, want of sleep, insufficient and improper food; prolonged convalescence after acute illnesses or after minor surgical operations, oral sepsis, early tuberculosis of the lungs, etc.

It was obvious that if these physically defective and delicate children were allowed to remain in an ordinary school their physical condition would, at best, remain stationary; whilst if they were sent to convalescent homes the prolonged stay necessary to effect a cure would seriously interfere with their educational work.

The result of the consideration of this problem was the opening of the first open-air recovery school at Charlottenburg in 1904. The situation of this school is ideal, the rough sheds and school barracks being erected in a pine wood within easy walking distance of a tram terminus on the outskirts of the town.

The children were chosen by the school doctor, and ninety-five were admitted; this number was subsequently increased to 120, and afterwards to 250. This extension of the numbers was due to the very satisfactory results of the first year's working of the school, during which time it was open for three months. In the second year it was open six months, whilst in the third year (1906) it remained open from April to Christmas-time.

The chief features of the school may be conveniently summarised here and considered in detail afterwards.

The children arrived at about 8 a.m., and returned home about 7 p.m. Four meals were given during the day, and after the dinner at 12.30 the children rested for two hours, being wrapped up in rugs and lying on deck chairs. The time given to ordinary educational work was reduced to a minimum (about $3\frac{3}{4}$ hours daily), and the curriculum was made as practical as possible. The children all received two warm baths per week. The school doctor visited the school about three times a week; he was assisted by a trained nurse, who visited daily. The number of children in each class was reduced to twenty-five; all the school work was carried on in the open air, the rough school buildings being used only in wet weather.

The results, after the three months, were as follows:—

Anæmia—Out of 34 children, 24 were improved or cured.

Scrofulous Diseases—Out of 38 children, 30 were improved or cured.

Heart Disease—Out of 7 children, 7 were improved.

Pulmonary Disease—Out of 21 children, 12 were improved or cured.

Mentally, the children became bright and alert after being dull and listless; whilst morally, great improvement resulted.

Dr. Frederick Rose, in his report to the London County Council on open-air schools, gives an excellent account of this school, and to his advocacy in this country the establishment of similar schools is very largely due. As he points out in the above report, the honour of having initiated this most important movement in preventive medicine belongs to Dr. Neufert, the educational adviser, and to Dr. Bendix, the school doctor, of the town of Charlottenburg.

The success of this school led to the establishment of similar schools in Germany at Mülhausen, Muncher-Gladbach, Dresden, and Elberfeld, whilst in 1906 the first English open-air school was opened by the London County Council in Bostall Wood, Woolwich, the site having been offered to the Council by the Royal Arsenal Co-operative Society.

The successful results obtained in this school led to the extension of the experiment, and in 1908 three open-air recovery schools were established in London, at Forest Hill, Upper Holloway, and Shooter's Hill; subsequently schools of this type for debilitated children have been established at Norwich, Halifax, Bradford, and Sheffield.

The movement has also spread to America, where an old school building was converted into an open-air school at Providence in 1907, whilst in July, 1908, an outdoor school for tuberculous children was established at Boston.[1]

[1] Hyams and Minot: *Brit. Journal of Tuberculosis*, p. 171, July, 1909.

The Establishment of an Open-air School.

In choosing a satisfactory site it is important that it should be within easy walking distance of the tramway terminus. Ground sloping towards the south and protected by woods from the north and east is to be preferred, whilst the maximum of fresh air and sunshine that can be obtained is essential.

The soil should be pervious and complete arrangements should be made for the disposal of the large amount of waste water. This is a serious problem where ready access to a sewer cannot be obtained, the bath waste water being very considerable in a school where 50 to 100 children are having two baths every week.

The water supply must be ample and good, as a considerable quantity of water is required for bathing, kitchen purposes, washing, and drinking.

In the uncertain weather of this country, it is necessary that some provision should be made for shelter during wet and stormy days. The types of building used in open-air schools are the following:—(1) At Charlottenburg two types of building are seen; one is simply a roof (supported at the corners by rough beams), under which the children work and have their meals; the other type consists of Doecker wooden buildings as used for temporary hospitals. These are supported on wooden piles so that the dryness of the floor is secured by an air space between it and the ground. The walls consist of a wooden framework covered with canvas; but these buildings are not used unless the weather is very severe.

(2) In London, both in the case of Birley House and Montpelier House, old buildings formerly used as dwelling-houses, and situated in large gardens, are in use; but as Dr. Newman, in his annual report for 1908, points out, these buildings "provide anything but satisfactory classroom accommodation." In the case of each school Doecker buildings have been erected in the gardens.

(3) In Sheffield a disused small elementary school in a country district was available. A central hall was used for

class work during bad weather, one classroom was converted into a kitchen by the provision of a range, copper, hot-water drum, sink, etc., whilst another was divided into two, one half being fitted up as a bathroom with a leaden floor and four rose showers, the other half being used as a medical inspection room. Two play sheds were available for use, the one facing south being used as a dining-shed.

(4) At Bradford school buildings have been erected—six classrooms, each with a teaching verandah, together with dining and resting-sheds being provided. Ample cross ventilation is obtained, and a corridor connects the various buildings, behind which the baths, kitchen, lavatories, etc., are placed.[1]

The Selection of Staff for Open-air School.

Teachers should be chosen who have special knowledge of hygiene, who are experienced in school journeys, nature study, and organised games, and who will deal firmly and sympathetically with the children.

The very satisfactory improvement in the conduct of the children which has been noted in all the reports published on these schools is due entirely to the excellent influence of the teachers combined with the removal of the children from street life.

Although the teachers' work is under conditions which are far more healthy than at an ordinary school, delicate or consumptive teachers should not be chosen, as the hours during which they are responsible for the children are very long, and the strain of the continuous four or five months' work is considerable.

A trained school nurse is also essential who will visit the school frequently, examine the children as regards cleanliness, assist at the periodic weighing and school medical examinations, and also visit the homes to advise mothers as to the best diet, number of hours of sleep, etc., required by the children.

[1] Kirkby, R. A.: *The Builder*, August 21st, 1909.

Selection of Children for Open-air School.

The children peculiarly suitable for treatment in these schools are those suffering from anæmia and malnutrition due to poverty, and the many debilitating conditions found in those children who grow up in a slum environment.

Early cases of pulmonary tuberculosis, anæmia due to oral sepsis, tuberculosis of glands, and children convalescing from acute diseases such as pneumonia, also do very well, whilst to the list may be added those children recovering from minor surgical operations such as the removal of tonsils and adenoids.

The children are usually recommended by the head teachers of poor district schools, and are sent to the school medical officer for examination. This first medical examination is most important as some cases will be found where the child will certainly derive no benefit from an open-air school; for example, children with advanced pulmonary tuberculosis, chronic heart disease, rheumatism, etc. The children should be selected some weeks before the school opens, as it will then be possible by suitable treatment to remedy such defects as adenoids and carious teeth. The latter is very important, and it is advisable to arrange for dental treatment as the child cannot benefit by the good food provided if the teeth are in bad condition. Both conservative treatment by fillings and extractions should be undertaken where necessary, and pressure may be brought to bear on parents who may object by making the treatment of such defects conditional to the admission of the child.

Careful attention should be paid to the possibility of cardiac dilatation. Dr. Clive Rivière,[1] in one of the London County Council schools noted five boys with cardiac dilatation at the first examination, and in all of them it increased later, so that restriction of activity became necessary. The admission of strong and robust children among debilitated ones in an open-air school

[1] "Open Air Schools, 1908." London County Council Reports, No. 1,248, p. 6. London: P. S. King and Sons, 1909. 6d.

should be avoided, as although they themselves derive great benefit, they set an example of strenuous living to the weakly which is absolutely harmful. Although most of the children will be drawn from the poorest parts of the city, the fact of the parents being comparatively well-to-do should be no bar to the admission of a suitable child, although in such cases the full cost of feeding will, of course, be paid.

In Charlottenburg it is proposed to establish an open-air recovery school this year (1910) for the children of the "high school" class, in which the parents will contribute 80 per cent. and the State 20 per cent. of the cost.

The Management of an Open-air School.

Transit is a matter of moment. In cities provided with an electric car service, little difficulty will be experienced in taking the children to the outskirts in the morning, as the cars taking men into the city at this time of day are usually comparatively empty on the outward journey. If the school be some distance from the car terminus it may be necessary as in Sheffield to provide waggonettes in order to complete the outward journey; this, however, is a serious item in the expenditure, and when the homeward journey from the school to the car is taken on foot, it is an important factor to be taken into consideration when selecting the children.

Feeding is a matter of great importance. It is usual to provide three meals daily—breakfast at about 9.15 a.m., on arrival; dinner, at 1 p.m.; and tea, before the homeward journey is begun. This course has been adopted in the schools of London, Bradford, and Sheffield, whilst at Halifax five meals were provided, lunch being given in the middle of the morning and supper in the evening. This system of giving meals frequently is adopted in the German schools, but in my opinion it is unnecessary and likely to cause indigestion in badly-nourished children.

The daily menu at the Sheffield school was prepared with the assistance of Miss Tilney Bassett, Principal of the

Sheffield School of Cookery. The following are details of the meals given:—

BREAKFAST: Oatmeal porridge, half a pint of milk and treacle.

DINNERS: *Monday*—Lentil soup and bread; bread pudding and sauce.

Tuesday—Hot-pot and greens; rice and stewed fruit.

Wednesday—Mutton broth and bread; boiled mutton, potatoes, carrots, and turnips.

Thursday—Irish stew and carrots; suet dumplings.

Friday—Boiled fish, parsley sauce, and potatoes; boiled jam roll.

TEA: Half a pint of hot milk, bread and margarine or bread and jam; parkin or very plain cake once a week.

Meal-times are most valuable from the educational point of view. Dr. Ralph Crowley writes as follows[1]: "No other opportunity for true education can be considered of greater value than this. The children must all have their hands and faces washed and the hair tidied. The older boys and girls should help in the serving. Politeness and attention to one another, especially of the boys to the girls, should be expected. The use of the knife, fork, and spoon should be taught, and generally how to take a meal in a civilised manner. Flowers gathered by the children should be on the tables, and certain children should be held responsible for seeing they are gathered and arranged."

Morale.—The excellent moral results obtained in open-air schools are largely due to careful supervision of training in good habits at meal-times, where the children can be made to realise that they are members of a big family.

Educational Work.—This should be as practical as possible. At Birley House School, London, the educa-

[1] CROWLEY, R.: "The Hygiene of School Life," p. 245. London: Methuen and Co., 1910. 3s. 6d. net.

tional work is most noteworthy.[1] History was taught by a series of dwellings which the children made and lived in, examples of cave and lake dwellings, wig-wams, a log cabin and a Norman keep being constructed by the children, who acted the lives of the people of the various periods.

Geography was taught by the construction of relief maps in sand or earth, and the various features of a river studied by an actual stream running down the side of the garden.

The open-air school also provides many opportunities for nature study, the habits of birds and insects, together with practical lessons on trees and plants, being matters of great and increasing interest to the children.

Gardening should be undertaken, and is very useful in providing the kitchen with green vegetables, whilst all the children should help in the housewifery connected with the school.

Arithmetic may be taught in a practical manner by measuring circumferences of trees, actual distances, etc.

Personal hygiene is a most important subject; each child should be provided with a tooth-brush and brush and comb, and the regular daily cleansing of the teeth should be insisted on.

Finally, singing and breathing exercises should be arranged for, and all work must be undertaken in the open-air except in stormy weather, when the sheds should be used.

Rest.—The children should rest in the open air for two hours after the mid-day meal. This resting time is a most important feature in the cure, for many children of this type suffer from insufficient sleep at home.

Each child should have a numbered rug and a deck chair, or better, a horizontal hammock-like couch. Some children sleep with difficulty at first, but it was found in the Sheffield school after the first week 90 per cent. of the children slept throughout the whole two hours.

[1] See " Open Air Schools, 1908." London County Council Report, p. 11, No. 1,248. London : P. S. King and Sons, 1909. 6d.

It may be necessary to give additional resting time in the morning to certain children.

Duration of Stay.—The object of the open-air school is to cure the children, therefore they should stay four to six months. The taking of children into a country district for a fortnight or so is of comparatively little value, and anything of the nature of permanent cure in a badly-nourished child will not be effected.

Some children will require more than one season at the school; others really require education under such conditions as are described in this article throughout their school life.

Baths.—The provision of shower-baths is essential. These act not only as a cleansing agency, but are of great value as part of the cure. They can be put up at a very small cost, and should, of course, be connected with the hot-water service of the kitchen. A daily shower should be given, if possible, warm at first and then gradually colder. Experience shows that these baths are most popular with the children and are looked forward to with great pleasure. In the Charlottenburg school mineral and slipper baths are also provided, and a small enclosure is used for air and sun-baths.

Financial Considerations.

The site of the school, being at a considerable distance from the centre of the city, will probably cost comparatively little; and if it is close to a tram terminus the transit of the children will not be expensive.

The buildings should be as simple and inexpensive as possible; and as in these schools the children are certified (in this country) as physically defective, under the Education (Defective and Epileptic) Act, 1899, a higher grant is earned from the Board of Education. The classes are, however, thus limited to twenty-five children, and therefore more teachers are required than in an ordinary school.

The cost of feeding, which works out for fifteen meals per child per week, at a little less than half-a-crown, will vary with the parents' ability to pay.

At the Sheffield school their contributions varied from 2s. 6d. to 6d. per week.

The following figures may be of interest, being the first year's expenses of the Sheffield school for fifty children:—

EXPENDITURE FROM JUNE 21ST TO END OF OCTOBER.

Working Expenses (*Maintenance*).

Salaries of Teachers	£67	10	3
Provisions	98	18	0
Conveyance of Children	80	7	0
School Equipment	88	14	4
Fuel, Light and Cleaning, and Rates	31	7	1
Gross cost	£366	16	8

Less—Estimated £70 in grant and £18 3s. 6d. in parents' contributions.

Any movement such as the present one, improving the nutrition and vitality of the children, will tend to reduce the number of cripples, and thereby save the considerable expense which will have to be laid out on special schools for crippled children. Diminishing the number of ill-nourished children will also lessen the risk of these children in after-life becoming incompetent by lowered vitality; therefore the expense of maintenance in workhouses, etc., will be lowered.

Dr. Frederick Rose[1] has estimated the cost of the buildings of an open-air school for 100 children at £14 per place for a day school and £20 per place for a residential school.

Results of Open-air Schooling.

These may be considered under the following headings:

(*a*) Physical: 1. *Increase of Weight*, showing improved nutrition.—Both at the Sheffield and Bradford schools the children gained during the first month as much as they would have gained during four months at an ordinary school. Throughout their stay of four months,

[1] Rose, F.: "Tuberculosis in Infancy and Childhood," p. 337. Edited by T. N. Kelynack, M.D. London: Baillière, Tindall and Cox, 1908. 12s. 6d. net.

the Sheffield children gained on an average 5.9 pounds, whilst it was calculated that children attending the ordinary schools gained 2.4 pounds.

2. *Increased Chest Measurements.*—Increase was found to have taken place in nearly all the children. This represents increased breathing power, although a slight proportion of the increase is due to additional fat in the chest wall. (Twenty-three children out of forty-six increased more than one inch on full inspiration.)

3. *General Appearance of the Children.*—The improvement under this heading was most appreciable, and has been noted in the reports on all the schools of this type. Dull and listless on admission, the children soon became bright and lively. This was noted, not only in their bodily movements, but also in their mental state, which quickly responded to the good food and open-air conditions.

4. *Effect on the Proportion of Hæmoglobin in the Blood.*—The following statement by Dr. Crowley[1] shows the very marked increase of hæmoglobin in the Bradford children:—

	Boys.	Girls.
Average percentage of Hœmoglobin on admission ...	78	80
„ „ „ leaving ...	88	90
„ increase per cent.	10	10

The Hæmoglobinometer used was that of Von Fleischl.

(*b*) MENTAL: The great majority of the children showed marked increase in mental alertness, and although the interruption in their work in the various standards was considerable, most of them were able to take their place again in the ordinary school with little difficulty, whilst their powers of observation were much increased.

(*c*) MORAL: The improvement of the children in behaviour has been noted as a striking feature of the open-air school. The substitution of the "family" life at the school for the stress of street life is marked by excellent results. Many who are sullen and morose on admission become bright, willing, obedient, and anxious to work for the good of the small community.

[1] CROWLEY, R.: "Hygiene of School Life," p. 251. London: Methuen and Co., 1910. 3s. 6d. net.

(*d*) How far are the Results Permanent? This is a matter of great importance, and the following may be of interest:—In the Sheffield school at the end of October the results were classified as follows: Cured, 17; improved, 32; stationary, 1. On examining the children four months later, the condition of the children as regards weight was as follows: Gained, 18; lost, 23; same weight as in October, 2. Generally speaking, the results were expressed as good, 18; fair, —; poor, —.

This result may, as far as it goes, be considered very satisfactory, for most of the children come from very poor homes.

General Conclusion.

The rapidity with which this movement in Preventive Medicine is spreading and the excellent results which have been obtained, point to the fact that the open-air school will influence elementary education as a whole to no inconsiderable extent.

The movement will tend to check the erection of expensive buildings on costly sites in the central areas of cities where a train or electric car service is available to take children out to the woods and fields of the suburbs.

School buildings will cost less, ventilation will become more efficient as teachers and parents realise the value of fresh air and the necessity of the open window, whilst the influence of the open-air school will be an important factor in counteracting debilitating conditions during childhood and thus improve the physical efficiency of the nation.

REFERENCES.

School Document No. 2: "Tuberculosis amongst School-Children, and the Outdoor School." Boston U.S.A. School Committee. City of Boston (Mass.) Printing Department.

"Fifth Annual Report, containing account of School of Outdoor Life." Boston (U.S.A.) Association for Relief and Control of Tuberculosis. Boston (Mass.), U.S.A.

"School Excursions and Vacation Schools." Board of Education, Special Reports. Vol. 21. London: Wyman and Sons, 1907. [Cd. 3866.] 5½d.

"Waldschule im Bergischen Lande." Elberfelder Verein für Gemeinwohl.

BENDIX: "Ueber die Charlottenburger Waldschule" (with two illustrations). *Vierteljahrschrift für Gesundheitspflege.*

BENDIX: "Verhandlungen der VII. Jahresversammlung des Deutschen Vereins für Schulgesundheitspflege." Berlin: Verlag von Teubner.

BIENSTOCK: "Die Waldschule in Mülhausen." *Strassburger Medizinische Zeitung*, 1 Heft, 1907; *Zeitschrift für Schulgesundheitspflege*, No. 11, 1908 Hamburg: Leopold Voss.

BYLES, A. HOLDEN: "The Open-Air School" (with twelve illustrations). *World's Work*, January, 1909; 20, Bedford Street, W.C.

CROWLEY, RALPH H.: "Hygiene of School Life" (p. 230). London: Methuen and Co., 1910. 3s. 6d. net.

CROWLEY, RALPH H.: Report on Thackley Open-air School. Bradford Education Committee, 1909.

CROWLEY, RALPH H.: "The Open-air School Movement." *British Journal of Tuberculosis*, July, 1909. London: Bailliere, Tindall and Cox. 1s. 6d.

GORST, SIR JOHN: Chapter in "The Children of the Nation." London: Methuen and Co., 1906. 7s. 6d. net.

GRAY, ERNEST: "Open-Air Schools." North of England Education Conference, 1908. *School Government Chronicle*, January 11th, 1908. 6d.

HALIFAX: "Bermerside Open-Air School." Halifax Education Committee.

KELYNACK, T. N.: (Editor) "Tuberculosis in Infancy and Childhood," p. 329. London: Baillere, Tindall and Cox, 1908. 12s. 6d. net.

KIRKBY, R. A.: "Elementary School Planning." *The Builder*, August 21st, 1909.

KÖNIG: "Die Waldschule in Mülhausen." Strassberger Druckerei und Verlagsanstalt.

KRAFT, A.: "Waldschulen. Zürich: Verlag, Orell Füssli, 1908. M.0.75.

LANGE, W.: "Die Charlottenburger Waldschule" (with four illustrations). *Neue Bahnen*, xviii., No. 11.

NEUFERT AND BENDIX: "Die Charlottenburger Waldschule" (with six illustrations). Berlin: Urban und Schwarzenberg.

NEUFERT AND ROSE, F.: Volume III. of "Transactions of the Second International Congress of School Hygiene, London." London: Royal Sanitary Institute, 1908. 5s. net.

NEWMAN, GEORGE: "Annual Report of Chief Medical Officer of Board of Education," 1908, p. 120. London: Wyman and Sons, 1910. [Cd. 4986.] 8½d.

ROSE, F.: "Open-Air Schools." *Archiv für Volkswohlfahrt*, Berlin, April, 1909.

ROSE, F., AND KERR: "Report of the London County Council on the Open-Air School at Bostall Wood, 1907" (with eight illustrations). London: King and Son, 1908. (No. 1164.) 1s.

ROSE, F., AND KERR: "Report of the London County Council on the three Open-Air Schools held during 1908" (with six illustrations). London: King and Son, 1909. (No. 1248.) 6d.

ROSE, F.: "Open-Air Schools." London: Royal Sanitary Institute.

ROSE, F.: "Open-Air Schools." *Progress*, April, 1908. London.

ROSE, F.: "Open-Air Schools." London: Penny and Hull, about 1908. 1d.

SCHAEFER: "Waldschule der Stadt Gladbach." Bonn: Verlag Marrtin Hager.

WILLIAMS, RALPH P.: "Report on Whiteley Wood Open-Air Recovery School, Sheffield," 1909 (with eight illustrations). Sheffield Education Committee.

WILLIAMS, RALPH P.: "The Sheffield Open-Air Recovery School" (with four illustrations). *School Hygiene*, Vol. i., p. 136, March, 1910. London. 6d.

WILLIAMS, RALPH P.: "The Sheffield Open-Air School." *British Journal of Tuberculosis*, Vol. iv., No. 2, p. 101. London: Bailliere, Tindall and Cox., 1910. 1s. 6d.

XVII

THE SCHOOL NURSE

BY

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THE school nurse is now recognised as an essential officer in any complete scheme for an adequate supervision of the physical need of children attending our public elementary schools. The subject may be well considered under three principal headings: the duties of the school nurse, the selection of the most suitable persons to perform these duties, and the position of the school nurse in such countries as America and Germany.

THE DUTIES OF THE SCHOOL NURSE.

The functions of a school nurse may be concisely summarised as follows:—

1. Assisting the school doctor during the medical examination of the children.

2. Visiting the homes of the school children in order to persuade and to assist parents to obtain treatment for their children with remediable defects.

3. Systematic visiting of schools to inspect children for verminous conditions, contagious skin diseases, and conjunctivitis, and the consequent visitation of certain homes.

4. Attendance at the school clinic to assist the school doctor while he examines and treats skin diseases, etc., amongst the poorer classes.

5. The giving of lectures and demonstrations regarding matters of practical hygiene to the senior school girls and to mothers from the poorer districts.

Assisting the School Doctor during Medical Inspection.

A considerable share of the direct organisation of the work may be assigned to the school nurse. For instance, she should be in the school arranging preliminaries for about ten minutes before the arrival of the doctor, so that he may start work at once. She should record the temperature of the rooms used, immediately before and after use. She should see that children are not kept too long undressed, but at the same time she should always have one in readiness for the doctor. Usually a sufficient number of helpers, to assist in dressing and undressing, is provided by the head teacher, but, especially at the beginning, these require supervision and direction. With older children the work once started is easy, but with infants constant attention has to be given. Teachers give a varying amount of assistance in the work, and the nurse must be tactful and allow them to exercise considerable supervision and direction if they so desire.

During the routine medical inspection ability to organise is one of the most valuable accomplishments, or perhaps natural qualities, of the school nurse. Although organisation is so important, it should, except in the infants' departments, take up only a small part of the nurse's time; the arrangement of which depends on the number of whole-time assistants employed. Sometimes the nurse is required to take down on the medical inspection form the results of the doctor's examination at his dictation. A female clerk, however, should be employed for such work. Often the taking of weights and heights and the noting of the condition of the clothes and boots form important parts of the nurse's share of medical inspection. The testing of vision with test types can also be quite accurately done by a well-trained school nurse.

The proportion of the above work which the nurse can undertake depends on the rate of examination by the school doctor and the amount of help received from the teachers, but, assuming that the school doctor takes an

average of three minutes to examine a child, then the nurse should be able to take charge of the weighing and measuring, the examination of clothes and boots, and the vision testing of each eye separately and both eyes together of from fifteen to twenty children in an hour. Dealing with more than fifteen seven-year-olds an hour is difficult because of the greater length of time which vision testing takes at this age. A greater number of infants than of older children cannot be examined, in spite of their vision not being tested, as the handling of them is more difficult and requires more care. If at any time the doctor should get too far ahead, the nurse ought to leave over a certain amount of vision testing to be completed later. At no time should more than ten children be waiting to have their eyes tested, as the noise made by a crowd of children impedes the doctor and often leads to hurried and inaccurate work by the nurse.

If time permits and if the mother attends the inspection, the school nurse can occasionally save a home visit by taking the opportunity to instruct the mother on certain hygienic matters, such as the cleansing of verminous heads, the care of the teeth, and the like. This should always be done in a perfectly private and confidential manner.

The Visiting of the Homes of School Children.

A very important part of a school nurse's duties consists in visiting the homes of the school children in order that treatment of remediable defects discovered during medical inspection may be secured. Parents are advised either verbally or by letter of defects requiring medical treatment, but very few, however, do anything on their own initiative. This is hardly surprising in view of the fact that either the removal of tonsils or of adenoids or the provision of spectacles is required in the greater proportion of those cases. The removal of tonsils and adenoids means an operation under an anæsthetic; the provision of spectacles is quite a long process, requiring, as it does, complete dilatation of the pupils and the prescription and procuring of spectacles.

During her visit the nurse urges the parents to take suitable action and advises them how to proceed. In the first place they are recommended to consult their own medical attendant, but if the parents are poor and have no family doctor, they are advised to go to the proper dispensary or hospital. Recommendation cards may be given, but parents are expected to make some effort to obtain these from subscribers, clergymen, and other distributors of charity. Treatment being available, the nurse makes sure that the parents take advantage of and persevere with it. If, on the third visit, nothing has been done, the nurse should report the case to the school medical officer, who will then consider whether or not action is advisable under Section 12 of the Children's Act. Experience points to repeated visits as the means of increasing many times the number of cases treated. A secondary but not unimportant advantage is that a fairly complete record of the immediate results of medical inspection is obtained.

The Systematic Visitation of Schools.

The systematic visitation of schools by the school nurse has for its principal objects the constant supervision of all children who are verminous or who suffer from contagious skin diseases, and those who suffer from chilblains, sores, etc. It is convenient to visit each department at least once fortnightly.

In regard to vermin, the teacher should pick out the worst cases of pediculosis capitis. These are examined in some suitable room, privately and separately, but except in babies' classes are not to be inspected in the school-rooms. In addition to the number picked out by the teacher a certain number are discovered in a routine examination, so arranged that each child has its hair examined at least once in each school session. The routine examination takes place in the class-rooms, a certain section being examined during each visit.

The legal power for the examination of the person and clothing of school children is provided for by Section 122

of the Children Act, 1908. "The local authority should direct their medical officer or any person provided with . . . the authority in writing of their medical officer . . . to examine . . . the person and clothing of any child attending school." The nurse therefore should be provided with a written authority.

Special cards are made out for those children who have living vermin in their hair, and they are seen at each subsequent visit of the nurse until two examinations with negative results are obtained. The nurse, in consultation with the head teacher, at once sends the worst cases home; the remainder are kept in school to the end of the attendance; all are told to have their hair carefully combed before the next attendance and to thereafter follow out the advice given on printed forms (sometimes these are of a distinctive colour) which are distributed. The teacher re-admits the children if no living vermin are present. Although the parents may carefully comb the heads and free them from living vermin, it frequently happens that they do not effectively apply paraffin or other parasiticides, and consequently at the next visit of the nurse live vermin are again found. On this second finding a warning notice is sent home with the child. If no improvement takes place the nurse visits the home and offers to show the mother how to proceed, and she is usually allowed to cut away part of the hair. If the parents still neglect the child it is excluded from school. The parents are asked to explain their neglect to the Attendance Sub-Committee, and if it then appears that they are unlikely to take prompt measures they are prosecuted for the non-attendance of their children.

Another method of procedure is provided by Section 122 of the Children Act. After due notice a child may be removed from school in order that its person and clothes may be properly cleansed. If only one or two of the very worst cases are taken at any one time considerable improvement is likely to result. If, however, the local Education Authority serve notices requiring the cleansing of great numbers at one time, considerable animus may be aroused.

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In certain cases the nurse finds very bad conditions existing in the homes; the children being neglected in other ways. Such cases may be reported to the Inspector of the National Society for the Prevention of Cruelty to Children, who can prosecute under Section 12 of the Children Act.

As regards clothing infected with pediculi corporis action is essential. To a greater extent than is commonly recognised, children of the poorer classes are infected with these parasites. In suspected cases the nurse should strip both boys and girls to the waist and carefully examine their clothes. Children affected are at once excluded, the parents are visited by the nurse, and verbal as well as printed instructions are given as to the boiling of the underclothes, ironing the seams of the upper garments and cleansing the bedclothes. If attention is not at once given to the directions, action may be taken by the School Attendance Sub-Committee similar to that exercised with regard to children with neglected, verminous hair.

Ringworm of the head is often met with. Short and broken hairs are taken from suspicious cases and are sent to the Municipal laboratory for examination. On a positive result being returned the child is asked to attend the school clinic. There, the school doctor either advises the parents to consult their own doctor, or in poor cases himself prescribes treatment.

All cases of ringworm of the body, scabies, impetigo and infectious sores must be excluded from school and go direct either to the doctor, the chemist, or, in poor cases, to the clinic.

Where children suffer from chilblains the quality of the clothes and footgear should be taken into consideration, and inquiries made as to whether or not the children are underfed.

The nurse at times undertakes any small surgical dressings, etc., during her visit to the various schools, but unless the visits be very frequent this work is likely to be of a casual description.

Work at the School Clinic.

Where large numbers of cases of skin disease have to be treated, a card register of the cases kept, ointment distributed, and, at times, hair epilated or cut, a nurse is the most valuable assistant a doctor can have. Whatever other clinics may be established, the advantage of the presence of a nurse is obvious.

Lectures and Demonstrations.

The giving of lectures and demonstrations on matters of personal practical hygiene to the elder girls and to mothers from the poorer districts is likely to be followed by good results. In these lectures the care of the hair and teeth, the advantages of cleanliness of the person and home, the necessity for fresh air and breathing through the nose, are some of the principal subjects touched upon. If the nurse's time is not otherwise fully occupied, arrangements should be made for such lectures and demonstrations.

The Selection of a School Nurse.

The duties which may be assigned to the school nurse having been enumerated, one can now discuss the qualifications most necessary for school work. It is needless to say that a fully-trained nurse is essential. Beyond this it is much more a question of native qualities than additional training. The average salary at present offered is £90 to £95 a year, with uniform.

Success in, rather than experience of, district work should be given the preference at the appointment of a candidate. A popular district nurse is likely to be successful in persuading parents to obtain treatment for their children, and this is one of the most important of the nurse's duties. Equal reliance, however, can be placed in the general trained nurse with no experience of district work, provided that she has a ready understanding of others, is sympathetic, patient, even in temper, and if possible has a saving sense of humour. She must be

tactful: *tact is the first essential.* Other necessary qualities are activity and capacity for work; therefore it is best to choose strong, healthy women under thirty-five. Any tendency to gossip should disqualify, but it is very difficult to discover a nurse's character in this respect. It is also perplexing to estimate from testimonials what power of organisation a nurse possesses. This, however, can be judged of, to a certain extent, during a personal interview.

Experience in skin disease, fever work, or in a children's hospital may assist one to decide between two nurses if they appear equal in the qualities mentioned above, but not otherwise.

Proportion of Nurses to Schools.

In order to estimate the number of nurses required for a school district many points must be considered. In small urban districts with populations of from twenty to forty thousand, one whole-time nurse only is usually appointed. In larger towns with populations up to 100,000 two nurses are generally considered sufficient. When two nurses are appointed, although each should be acquainted with the work of the other, different duties may with advantage be assigned to them. Thus systematic visiting of schools and attendance at the school clinic may provide work for one, whilst the other confines herself to assisting the school doctor during medical inspection and visiting the homes of children in whom defects requiring treatment are found. In still larger communities a greater number of nurses can usefully be employed.

In rural districts where the population is scattered, full time nurses should not be appointed. These would not only have to travel from one district to another, but would spend a great deal of time in getting to know the districts and in finding their way to the children's homes. It is best in such cases to requisition the services of district nurses who are intimately acquainted with the localities, and many of the poorer people in them. In such cases one has to make use to the greatest advantage of the material at disposal, but the school doctor should take

pains to make the part-time nurse fully appreciate what her duties are, and how they should be carried out.

The School Nurse Abroad.

In this insular country we do well to look afield. Much that is suggestive and helpful may be learnt from a consideration of the work of the school nurse in such progressive countries as America and Germany. A brief description of the New York system[1] conveys some idea as to how the work is carried out in the large towns of the United States.

Each nurse is assigned to duty in a group of schools. She must visit each school each day :—

(1) *Morning Inspection.*—In a special room the nurse receives all children ordered to report to her for treatment by the inspector, who, by a code number on the child's card, indicates its disease. These cards include pediculosis, ringworm, favus, scabies, impetigo, molluscum contagiosum, and conjunctivitis. The nurse gives appropriate advice and treatment according to printed instructions.

(2) *Routine Inspection.*—The nurse makes a weekly routine inspection of the eyelids, hair, skin and throat of each pupil. The nurse must not touch the child, but the latter is instructed to pull down the eyelids, open the mouth, show the hands, and, in the case of girls, lift up the back hair. Cases of pediculosis are under the exclusive care of the nurse. All other cases are referred for confirmation of diagnosis to the medical inspector. Cases of suspected diphtheria, scarlet fever, measles, whooping cough, chicken-pox and mumps, are, in the absence of the inspector, to be referred to the principal for exclusion. These are visited by medical inspectors, the nurse not being allowed to visit the homes of such cases.

(3) *Home visits* are made to the following: (*a*) Flagrant cases of pediculosis. (*b*) Excluded cases who do not return at the appointed time. (*c*) Cases of trachoma. (*d*) The parents of cases with physical defects, who, having received notice to visit the nurse at the school, in order that they may receive instructions regarding the necessity for treatment, do not do so within three days. In such cases the nurse visits the home and explains the condition and urges the necessity for treatment. Re-visits must be made until evidence of treatment is shown, or the parents refuse treatment.

It will be observed that the scope of the work of the school nurse in New York is very much the same as that of the school nurse in England. The main point of difference is that a diagnosis having been made the nurse prescribes specified routine treatment.

[1] Rules and Regulations for Inspectors and Nurses. Division of Child Hygiene, Department of Health, New York.

In Brockton, Massachusetts, the physical examination is left to the nurse. The services of three physicians are retained whose duties consist in examining children referred to them by the nurse, and also in giving their sanction before the exclusion of any child on medical grounds. By this system a majority of cases which suffer from enlarged tonsils and adenoids, defective vision, and the more obvious physical defects, no doubt find their way to the physician, but cases of compensated heart disease and certain cases of incipient phthisis must be missed.

No school nurses have been appointed as yet in Berlin, but a free translation of the published duties of the school nurses at Charlottenburg is given below. It will be observed that their work is conducted on almost the same lines as that of the school nurse in England.

The duties of the school nurse at Charlottenburg are as follows :—

1. The nurse has to visit the homes of school children whose parents have not followed the advice of the school doctor with regard to medical treatment. She endeavours to persuade the parents to have their children treated. The frequent excuse given is that the parent has no time to take the children to the doctor. The school nurse finds out if this is so and reports in writing to the school doctor or teacher.

2. In cases in which it is definitely ascertained that the parents cannot go because of business duties or illness, etc., the nurse volunteers to take the children to a doctor. It may be that this means taking the child to a private doctor, to a dispensary, or to a poor law doctor, according as the parents are in a position either to pay or not to pay for medical treatment.

3. If a minor surgical operation is required, the nurse obtains permission from the parents before having anything done. These minor operations are chiefly for the removal of growths in the nasal passages.

4. If it is found that the procuring of spectacles, or a truss or bandages, is necessary, and if the parents cannot afford these, the nurse has to see that they are obtained through the local authority.

5. If a dirty or badly-clothed or badly-nourished child is found in the school, the nurse has to visit its home, inquire into the income of the family, and make a note of the condition of the house and the food used, and the opportunity that the child has for quiet sleep, and thereafter give advice for the betterment of those conditions. She ought also to treat children affected with head lice or other vermin. If the hangings of the house and clothes of the children are infected with vermin, then she orders their removal to the disinfecting station.

The advice which the nurse has to give regarding the upbringing, nourishment, and clothing of the children chiefly consists in advising as to proper diet and, in particular, pointing out the bad effects which alcohol has upon children, and the importance of washing clothes

frequently and of bathing the child, as well as the importance of having the living and sleeping rooms well ventilated.

In the cases of children who have discharges from nose or ear, or who suffer from defective vision, a specialist is required for their treatment. In such cases it is necessary to make arrangements with specialists who reside in the neighbourhood of the school.

REFERENCES.

At present the literature dealing with the school nurse and her duties is comparatively meagre. The following references will be of practical service:—

Among books the following should be consulted:—

HOGARTH, A. H.: "The Duties of School Nurses," in "The Medical Inspection of Schools." London: Henry Frowde and Hodder and Stoughton, 1909. 6s.

MACKENZIE, W. L.: "The Nursing Service in New York," in "The Medical Inspection of School Children." Edinburgh and Glasgow: William Hodge and Co., 1904. 10s. 6d.

The following papers are of suggestive value:—

FORBES, D.: "The Work of the School Nurse under the Medical Officer of Health." "Transactions of the International Congress on School Hygiene, 1907," vol. ii., p. 475. London: Royal Sanitary Institute, 1908. 5s., or 12s. 6d. for three vols.

HAYWARD, J. A.: "The Co-operation of Doctor, Teacher, and Nurse in Medical Inspection." *Ibid.*, vol. ii., p. 469.

In many reports and pamphlets the subject is alluded to, and the following should be consulted:—

"Annual Report of the Medical Officer of Health for Cambridge for 1907."

"Rules and Regulations for Inspectors and Nurses assigned to duty in the Medical Inspection and Examination of School Children. City of New York Department of Health, 1909."

"Report of the School Medical Officer to the London County Council for the twenty-one months ending December, 1908." (No. 1251.) London: P. S. King and Son, 1909. 2s.

XVIII

THE MEDICAL EXAMINATION OF SCHOOL TEACHERS

BY

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THE teaching profession is, on the whole, a healthy one; the mortality, in England and Wales, is lower than that of other professions except the clerical, and very much below the average for all occupied and retired males. But there can be no doubt that school teachers, especially teachers in the elementary schools of large towns, frequently suffer from preventable ailments which are produced, directly or indirectly, by school work. Moreover, the profession is not suitable for some individuals. Hence systematic medical examination of all school teachers is most desirable.

THE HEALTH OF TEACHERS.

The reports of the Registrar-General show that in England and Wales the following are the chief causes of death amongst school teachers:—phthisis, diseases of the circulatory system, and affections of the nervous system. The mortality from phthisis amongst teachers is higher than amongst medical men, clergymen, barristers, and solicitors, but less than that of the male population generally.

The statistics published by W. Todds[1] (based on the returns of the Teachers' Provident Society) show that during 1906 the chief ailments causing absence from school duties were influenza, throat affections, chest diseases (phthisis and bronchitis, etc.). In the government returns of diseases, for which "breakdown" allowances were granted (under the Superannuation Act), the most frequent ailments were nervous diseases—chiefly neurasthenia.

Of the ailments for which the writer has been consulted by school teachers the following are the most frequent of those which had been directly or indirectly caused or increased by school work:—neurasthenia and various neuroses, migraine, headache, Graves' disease, diabetes mellitus, throat affections (loss of voice, laryngitis), phthisis, and dyspepsia.

During attendance at, or residence in, a training college the young teacher's health may be impaired by excessive study, and this risk is greater at those colleges at which the students work for a university degree in arts or science in addition to the ordinary teacher's certificate. Women students are more liable to suffer in health than men. Students who take up many new subjects in the college curriculum are, of course, more liable to suffer from overstrain, and especially those who commence a new language. If Latin or Greek has not been studied before the student enters the training college, it is liable to cause mental overstrain, in certain individuals, when it is commenced as a new subject during the busy college curriculum.

After the certified teacher commences work at school a common cause of impairment of health is mental overstrain through the very long time devoted daily to teaching, through the correction of a large number of the written lessons of the pupils, through evening classes and private tuition, and through study in the evenings for higher examinations in addition to the daily school work.

[1] Todds, Walter: "Some Prevalent Diseases Incidental to the Profession of Teaching in Elementary Schools." Transactions, Second International Congress on School Hygiene, Vol. III., p. 853. London: Royal Sanitary Institute, W. 1908. 12s. 6d. three vols.

During school hours there is often much mental strain when the classes are large. The necessity for speaking very loudly in noisy school-rooms causes great strain of the voice. The bad ventilation of school-rooms predisposes to phthisis and tuberculous diseases, and many teachers increase the risk of tuberculous disease by not taking sufficient open-air exercise. If the interval between morning and afternoon school should be very short, the mid-day meal is liable to be hurried, and dyspepsia often occurs.

THE DISEASES AND AILMENTS OF SCHOOL TEACHERS.

Nervous Affections (neurasthenia, neuroses) are the ailments which most frequently produce impaired health. The causes of mental overstrain just mentioned all contribute to the production of neurasthenia. *Headache* is a troublesome affection from which many teachers (especially women) suffer frequently. Common causes are neurasthenia, mental overstrain, migraine, bad ventilation of the school-room, dyspepsia, and defects of vision due to errors of refraction of the eye (myopia, hypermetropia, and astigmatism). *Graves' Disease*, in its mild forms, is probably a little more common amongst female teachers than in other individuals. The death-rate from *diabetes mellitus* amongst school teachers is a little above the average of all occupied and retired males in England and Wales. *Affections of the throat* (larynx and pharynx) are common amongst teachers and are caused chiefly through speaking too loudly, too much, and too rapidly. An important factor in the production of these throat affections is the necessity for speaking very loudly, owing to two or more oral classes being conducted in the same room, or through the class-room being adjacent to a noisy street. Statistics show that *tuberculosis* in its various forms is the most common cause of death amongst school teachers. Bad ventilation of the school-rooms, very large classes, dusty school-rooms, overwork, insufficient exercise in the open-air, are all predisposing causes. In some cases infection by dried sputum from tuberculous scholars is probably the

cause of tuberculous disease in the teacher; also a tuberculous teacher may infect a pupil.[1] *Defects of Vision.* Myopia (or short sight) is very common amongst school teachers. Amongst 104 teachers in the training department at the Victoria University the writer found that thirty-three suffered from well-marked myopia (=31.7 per cent.). This defect had usually commenced when the teacher was a school pupil. It often increases during the period at the training college, and sometimes afterwards. Hereditary tendency has some influence, but overstrain of the eyes is a very important cause. This overstrain is chiefly due (*a*) to prolonged use of the eyes for fine, near work, (*b*) to working in defective light, (*c*) to the book or paper being too close to the eyes, (*d*) to the bad type of the books read. The type of school books is still unsatisfactory. Cohn's minimum type is a fair standard of the smallest type which should be used. Amongst 250 school books examined by the writer in 1906 in Manchester, 111, or 44 per cent., were defective as regards the type. When the teacher commences his professional work the mischief is usually already done as regards myopia, but the condition may be made worse by the injurious influences described. Hypermetropia and astigmatism are also common amongst teachers.

Medical Examination of School Teachers.

At the commencement of the course of training for the profession of teacher in a public elementary school, the Board of Education requires a medical examination on admission to the training college or university. Also at the commencement of each subsequent year of study a certificate must be given that the teacher's "health is sufficient to allow the course to be continued without undue strain." At the end of the course of study at the teaching college, another medical examination is required,

[1] See "Tuberculosis in Infancy and Childhood." Edited by Dr. T. N. Kelynack. London: Baillière, Tindall and Cox, 1908. 12s. 6d. net; also "Tuberculosis among Teachers," in Dr. David Forsyth's "Children in Health and Disease," p. 119. London: John Murray, 1909. 10s. 6d.

and a certificate must be given that the teacher is "strong enough for continuous employment as teacher in a public elementary school." Similar medical examinations of school teachers who do not propose to work in public elementary schools are, of course, very desirable.

The medical examination on admission to the training college, and at the end of the course of study there, should be conducted in much the same manner as that for life assurance. The examiner should endeavour to ascertain (1) if the candidate is strong enough to bear the strain of the course of study at the training college, and (2) if there are signs of any disease which would prevent the candidate following the profession of a school teacher continuously.

It is advisable to inquire whether the candidate has suffered from any serious illness (especially pleurisy, pneumonia, rheumatic fever, chorea, diphtheria, scarlet fever, acute Bright's disease, severe anæmia, and dyspepsia); whether there has been dropsy of the feet or face at any time; and whether the candidate has suffered from any of the following symptoms:—shortness of breath, troublesome cough, loss of flesh, weakness, persistent thirst, night sweats.

The previous short summary of the diseases from which teachers are most liable to suffer indicates the affections for which careful search should be made in the medical examination. The lungs and heart should be examined in all cases; indications of disease of the nervous and digestive systems, of the kidneys and blood should be noted; and when there is anæmia an endeavour should be made to ascertain its cause. When the candidate appears wasted or badly developed, the weight and height should be taken. The extent of the physical examination will vary with the symptoms of impaired health which the candidate may present.

Signs of tuberculous disease of the lungs or other organs, even when the disease is at the earliest stage, should, of course, exclude the candidate from the training college or school work.

Candidates who suffer from any persistent laryngeal

affection should not be allowed to commence their course of training until such affection has been cured. Affections of the larynx or pharynx, causing frequent loss of voice and hoarseness, would prevent the teacher following his or her employment continuously, and might make it necessary to retire from the profession. Hence candidates who suffer from such throat affections should not be allowed to enter the training college, or should only be allowed to do so when the throat affection has been cured.

Candidates who suffer from aortic regurgutation should not be allowed to enter the training college or to commence duties as teachers in public elementary schools. In many cases of mitral disease, when the compensation is good and there are no symptoms of impaired heart's action, the candidate may be accepted, but should be given to understand that there is a risk of cardiac failure and inability to follow the teaching profession at a later period. By a suitable mode of life much may be done to prevent or postpone such cardiac failure. Mitral disease is the affection which I have met with more frequently than any other *organic* disease, in the examination of teachers at the training department of the Victoria University.

Candidates who suffer from chronic Bright's disease, diabetis mellitus, or glycosuria, should not, of course, enter the training college or commence duties as teachers in public elementary schools. It is not necessary to exclude cases of true "functional albuminuria." Albuminuria in young male teachers is occasionally due to the presence of semen in the urine, as a result of nocturnal emissions or masturbation, or to pus owing to urethral discharge, and in female teachers to leucorrhœa. Hence microscopic examination for spermatoza, pus, or vaginal epithelial cells is desirable when albuminuria is detected in apparently healthy individuals. When the thyroid gland is enlarged, the candidate should be carefully examined for signs of Graves' disease: and it is advisable to examine all female candidates for the chief signs of Graves' disease, viz. (1) rapid action of the heart, (2) exophthalmos, (3) enlarged thyroid, (4) tremor of the hands. If there should be

definite signs of Graves' disease, or if two of the first three symptoms just named are well marked, it is better that the candidate should be rejected, at least temporarily. Young females who present only slight but definite signs of Graves' disease should not study in the training college nor undertake duties as teachers. It is important, however, to clearly indicate to the candidate that the disease is often curable or greatly benefited by rest and suitable treatment. When a cure has been obtained by rest and treatment, study or teaching might be continued, though usually some other occupation is more suitable.

Neurasthenia, as already mentioned, is a common cause of "breakdown" amongst teachers after a few years of professional duties in school; but at the medical examination it is not easy to detect definite early signs of this affection which would enable one to foretell that severe neurasthenia will follow at a later period. Candidates presenting *well marked* symptoms of neurasthenia should not be allowed to enter the training college or to commence duties as teachers.

Candidates who are very anæmic should be excluded, at least temporarily. After treatment the anæmia may disappear and the candidate may then be admitted.

Those whose vision or hearing is very defective do not usually attempt to enter the teaching profession. In many cases an examination of vision and hearing is desirable, and it would be well to make such examinations in all cases. When there is a defect of vision which cannot be corrected by glasses, and is so great that it would interfere with the efficiency of the candidate as a teacher, he or she should not enter the training college. Also when there is any defect of hearing, speech, or voice, which would interfere with the candidate's efficiency as a teacher, he (or she) should not be allowed to enter the training college.

Candidates who suffer from epileptic fits (unless the attacks only occur at very long intervals) and those who are the subject of very striking physical defects, deformities, and disfigurements, which would be very repulsive to

school children, should not enter the teaching profession.

In the certificate required by the Board of Education, at the end of the period of training at college, the medical examiner is required to state whether the candidate is free from all signs of disease. When this is not the case, he is required to state the "nature and extent of the impairment," and whether the "symptoms are to be regarded as transitory or lasting." He must also state whether he considers the candidate "strong enough for continuous employment as a teacher in a public elementary school."

It is to be regretted that vaccination is not now compulsory. Students who have not been vaccinated are accepted by the Board of Education, providing the student declare in writing that he or his parents have conscientious objections to vaccination. But in some colleges students who have not been vaccinated are not admitted for training, and teachers applying for appointments in some schools are liable to be excluded if not vaccinated.

REFERENCES.

It is unfortunate that up to the present the bibliography relating to matters connected with the medical examination of school teachers is exceptionally meagre. The following will, however, be of service for reference:—

BURGERSTEIN, L., AND NETOLITZKY: "Handbuch der Schulhygiene." Jena, 1902.

BURNHAM, W. H.: "A Contribution to the Hygiene of Teaching." "Hygiene des Lehr Körpers." Bericht über den I. Internationalen Kongress für Schulhygiene. Bd. 4. Pp. 483. Nürnberg.

HULBERT, H. L. P.: "The Teacher's Voice." Transactions of the Second International Congress on School Hygiene, London, 1907, vol. iii., p. 960. London: Royal Sanitary Institute, 1908. 5s. each vol., or 12s. 6d. for three.

MARR, G.: "Krankheiten der Lehrer und Lehrerinen," in Fürst and Pfeiffer's "Schulhygienisches Taschenbuch." Hamburg, 1907.

MILLIGAN, W: "Vocal Defects Amongst School Board Teachers." *British Medical Journal*, vol ii., p. 1097, 1895.

VAN TUSSENBROCK, C.: "Hygiene des Lehr Körpers." Bericht über den I Internationalen Kongress für Schulhygiene. Bd. 4. Pp. 323. Nürnberg.

VITRY, TH.: Hygiene des Lehr Körpers." Bericht über den I. Internationalen Kongress für Schulhygiene. Bd. 4. Pp. 354. Nürnberg.

WICHMANN: "Zeitschrift für Schulgesundheitspflege." Hamburg: 1903 and 1904.

WILLIAMSON, R. T.: "Health of School Teachers." *Medical Chronicle*, February, 1909. Manchester: Sherratt and Hughes.

YONGE, E. S.: "The Prevalence of Throat Affections among Female Elementary School Teachers in Manchester." *British Medical Journal*, vol. ii., p. 807, 1897.

Reference should also be made to:—

The Board of Education's Regulations for the Training of Teachers for Elementary Schools. [In force from 1st August, 1909.] London: Wyman and Sons, 1909. [Cd. 4737.] 7d.

The Board of Education's "Suggestions for the Consideration of Teachers and others concerned in the Work of Public Elementary Schools." London: Wyman and Sons, 1905. [Cd. 2638.] 8d.

Papers on "The Hygiene of the Teaching Profession." "Transactions of the Second International Congress on School Hygiene," vol. iii. London: Royal Sanitary Institute, 1908. 5s., or 12s. 6d. the three vols.

XIX

MEDICAL EXAMINATION OF SCHOOLS AND SCHOLARS IN SCOTLAND

BY

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IN a movement that correlates many forces, no one can tell where the true beginning is.

HISTORICAL CONSIDERATIONS.

In Scotland in regard to the medical examination of school children we are able to name one striking point of departure. On the "thirty-first day of March, one thousand nine hundred and two, in the second year of Our Reign," King Edward VII. appointed nine men as a Commission to inquire into the state of physical training in the schools of Scotland. Lord Balfour of Burleigh was Secretary for Scotland. The chairman of the Commission was the then Earl of Mansfield. The Commission included three members of Parliament, of whom one is now Vice-President of the Local Government Board for Scotland, the central authority for Public Health, Poor Law, and, more or less indirectly, for the public health aspects of Education; the Secretary of the Scotch Education Department; the President of the Boys' Brigade; a Chairman of a provincial School Board; a Baronet; and a Professor of Surgery in a

Scotch University. These names are significant. They prove that the Commission was not predominantly medical. All the more striking was the result: the most important deliverance of the Commission was a medical deliverance —the need for medical inspection of school children.

The Commissioners' remit is still more significant: "Whereas we have deemed it expedient that a Commission should forthwith issue to inquire into the opportunities for physical training now available in the State-aided schools and other educational institutions of Scotland; and to suggest means by which such training may be made to conduce to the welfare of the pupils; and, further, how such opportunities may be increased by continuation classes and otherwise, so as to develop in their practical application to the requirements of life the faculties of those who have left the day schools, and thus to contribute towards the sources of national strength."[1]

The aim was not ignoble, if also, perhaps, not without a suspicion of "militarising." The great Boer War was in progress. The minds of British people were effectively roused to questions of efficiency. But the Commission went only a little way before finding that the training of a lame horse is not economy, nor the regarding of amateur opinions, science. They sought facts. How few relevant facts there were any reader of the report can infer. Much tabular material of scientific value there certainly was; but nothing to indicate what prescription ought to be made for the living, actual children of Scottish schools. So an order was made to have 1,200 school children examined—600 in Edinburgh, 600 in Aberdeen. It would be tedious to explain why two towns were chosen. But the facts found were enough for the "parliamentary mind."

It was then that my interest in the examination of school children began; it will end, I fear, only when the interest in life itself ends. Nor do I quite regret the experience; for, after all, the end of philosophy is, with Faust, to reclaim waste from the sea, to cultivate our garden, to watch

[1] Report of the Royal Commission on Physical Training (Scotland), Vols. I. and II. London: Wyman. Edinburgh: Oliver and Boyd, 1903. [Cd. 1507 and Cd. 1508.] 1s. 1d. and 5s. 1d.

the never-failing spring covering the human earth with her flowers.

For the details of the facts found in Aberdeen and Edinburgh, the reader must go to the reports prepared for the commission by Professor Matthew Hay and myself. But I must quote the conclusions of the Edinburgh report:—

"On the basis of these facts and inferences I have framed the following general conclusions:—

"*First.*—The large number of serious and minor diseases directly and indirectly affecting physical efficiency and mental efficiency constitutes an overwhelming case for a medical inspection of school children.

"*Second.*—The facts as to physical exercises at the various schools (four in Edinburgh, 150 children from each; two in poor quarters, one in a fairly good quarter, one in a good artisan or shopkeeper quarter) demonstrate that a primary condition of any good result from increased physical training is adequate food and adequate clothing.

"*Third.*—No systematic exercise ought to be practised or enforced without a preliminary medical examination of the vital organs, to ensure that irreparable damage shall not result.

"*Fourth.*—That exercises should be organised—not as at present according to the code standard in which the child is studying, but—strictly in accordance with health, physical development and vigour."[1]

These propositions, with many more, were accepted and affirmed by the commission. Nor do I find, after eight years of experience, any reason for modifying them. They contain the germs of the system now organising itself in Scotland with unexampled and incredible rapidity. Medical examination, feeding, clothing, supervision of school children all have now full recognition in our educational statutes. Physical training had already an assured place both in the statutes and in the code; but it is now not the sole direct method, but one among many direct methods of applying scientific ideas "to the requirements of life."

[1] Report of the Royal Commission on Physical Training (Scotland), 1903, p. 100.

This, briefly and roughly, is how a world-wide movement towards personal preventive medicine became living and actual in Scotland.

Organisation and Administration.

How great the problem of administrative organisation is may be judged from the following facts:—The estimated population of Scotland in 1908 was 4,828,028. There are 971 School Boards. In 1908 there were 812,346 school children on the registers at the end of the school year. Of these, 712,096 were in (average) attendance. These numbers include the children of elementary and higher grade schools. Of higher grade school children there were (included in above) 19,928. The ages, for elementary schools, run from under 5 (11,635) to over 15 (8,283); for higher grade schools or departments the ages run from under 13 (1,853) to over 17 (1,013). This does not include continuation classes or secondary schools. Many of the latter are not under the school boards, but are aided by the State and inspected by the Department. For 1908 the numbers on the secondary school registers were 18,972.

Approximately, therefore, the numbers to be medically examined amount to 831,318 children out of a total population of 4,828,028. How this proportion compares with other countries I have no immediate means of ascertaining; but the general interest in education in Scotland predisposes me to infer that the proportion of children under the jurisdiction of the public authorities, central or local, is relatively high.[1]

Two legislative attempts were made shortly after the Commission's report to establish medical inspection; but the political conditions were unfavourable. England succeeded in reaping where Scotland had sown. It was not until January, 1909, that the Education (Scotland) Act, 1908, came into force and conferred on school boards the powers necessary for a universal system of medical

[1] Report of the Committee of Council on Education in Scotland, 1908-9. London: Wyman, 1909. [Cd. 4779.] 3d. Secondary Education (Scotland) Report for the year 1909.

inspection. Section 4 of that Act enacts:—"A school board may, and where required by the Department shall, provide for the medical examination and supervision of the pupils attending schools within their district to such extent and subject to such requirements as may from time to time be prescribed by any code or minute of the Department, and, for the purposes of this section, the school board may employ medical officers or nurses, or arrange with voluntary agencies for the supply of nurses, and provide appliances or other requisites. It shall be a condition of grant to the managers of any school within the district of the school board at which there is not provision to the satisfaction of the department for the medical examination and supervision of the pupils that such managers shall give admission and all necessary facilities for the discharge of his duties to any person so employed or supplied."

It is to be noted that the provision is "*may*, or where required by the department *shall*." This form was preferred to an absolute statutory obligation, because it left some possibility of growth. One locality benefits by the experience of another. Further, all schools within a school board's district are under the same obligation, whether they be under the management of the school board or not. Hence practically all schools—primary, secondary, technical and continuation—must either themselves provide for medical inspection or give facilities to the school board. Nothing escapes. As Scotch public opinion is favourable, no school organisations wish to escape. Even private schools may have their children medically inspected at the public expense.

Relation of Public Health and School Medical Services.

So far as regards the Education Act. But the Public Health Acts also affect schools, scholars, and teachers. The local authorities for public health[1]—that is the town councils

[1] Local Government (Scotland) Act, 1889.

in the towns, and the district committees in the counties—have complete responsibility for the general sanitation of school buildings and for the prevention of all infectious diseases, whether compulsorily notifiable or not.

Sanitation includes everything structural or functional that may lead to a "nuisance" and so affect injuriously the health of pupil or teacher—water supply, drainage, ventilation, lighting, cleanliness, etc. In many counties and in all towns, the plans must fulfil the building bye-laws of each locality, and these are usually very exacting.

As to infectious diseases among school children, the statutes are exacting to a degree. No child may be admitted to school when suffering from infectious disease, or when living in an infected house, unless proper precautions against the spread of infection are certified either by the medical attendant or by the medical officer of health. The medical officer of health may also examine any person, including school children, in order to ascertain whether the person is suffering from infection. This covers all "contacts." Infection, too, is interpreted in the widest sense and includes not merely the ordinary exanthemata, but also ringworm, favus, impetigo, phthisis, pediculosis, scabies, and any other parasitic disease of a similar kind. As, at the same time, the public health authority has equal powers in the home, obviously the area of school work covered by the public health officers is very great.

It is the policy of the Scotch Education Department to secure as close co-operation as possible between the new school medical service and the old public health service. Both are departments of preventive medicine—one dealing predominantly with the child, the other predominantly with the environment. In the department's circular 421[1] and the memorandum that went with it, this close connection of the two services was shown in detail. The Scotch Education Department, too, as central authority, works in concert with the Local Government Board for Scotland, which controls public health in Scotland.

[1] Circular 421, issued in March, 1909. London: Wyman, 1s. See also Memorandum on the Medical Examination and Supervision of School Children. London: Wyman, 1909. 2d.

In most of the localities—town and county—a system of medical inspection is either actually provided or is under discussion. Of the large towns each has to make provision for itself; the small towns are included in the county educational area. Up to date (March, 1910), the following towns have established medical staffs as follows:—Edinburgh, 3 whole-time medical officers, 1 chief, 2 assistants, 3 nurses; Glasgow, 1 chief medical officer, 20 part-time assistants in private practice; Govan, 1 chief, 10 assistants in private practice; Aberdeen, 1 chief, 1 assistant, 2 nurses; Perth, 1 chief medical officer; Dunfermline, 1 chief, 2 part-time assistants (not in practice). These illustrate generally the proportion of staff so far considered sufficient. The standard has been provisionally fixed at one medical officer to some 10,000 to 15,000 children. It is estimated that a whole-time medical officer can, within school hours, adequately examine for the first time about 4,000 town children, and it is suggested that all children should be examined systematically every second year. This means four examinations in the school period. This ideal may be difficult to attain, and experience must decide as to its practicability.

In the counties, the same approximate standard has prevailed; but the general tendency has been to appoint the county medical officer of health as director of the scheme, and to assign to him whole-time assistants, who are to act both as school medical assistants and as public health assistants. In ten leading counties this system is now approved and established. In two or three small counties, the county medical officership has been combined with the school medical officership. In one or two, a separate service is either proposed or established. In two or three others, schemes are under consideration on the same lines as in the larger counties.

But, in no case, with the exceptions of Glasgow and Govan, has a system been arranged on the basis of part-time assistants in private practice. And even the schemes for those two town areas have been approved only provisionally.

Of the secondary schools not directly managed by the school boards, some have elected to provide a system of their own; others accept the school board or county scheme.

It has to be added that, in the counties, medical inspection schemes have to be prepared and submitted by the County Education Committee, a special body composed of representatives from the county councils and from the rural or small town school boards. This Committee is practically a federation of school boards for such services as they cannot, each for itself, discharge adequately. The County Education Committee is a synthesis of two interests—the public health interest at one end, the educational interest at the other. Where the county medical officer has not been made director of the scheme, co-operation between him and the school medical officer is otherwise secured.

Teaching of Teachers.

A system of medical inspection cannot be satisfactorily realised unless the teachers are prepared for their part in the work. This was one of the Commission's recommendations. In Scotland it has already been honoured. Every "Student in Training" as a teacher must go through a course of some seventy hours' training in school and personal hygiene. This course is intimately related to the physical training course. The training of teachers in Scotland is carried out mainly by four Provincial Committees, who administer State funds. There are also two denominational centres—one Episcopalian, one Roman Catholic; but these also provide a similar course. The courses are taught by medical lecturers, of whom there are nine. Of these, seven are whole-time officers; two are part-time officers. In one instance, both the hygiene and the physical training are under the management of the medical officer. These officers are also responsible for medically examining students at the beginning and end of their training.

The general nature of the instruction and the principles

regulating it are sketched in two small official documents[1] and in the Annual Reports of H.M. Chief Inspector of Schools. The teaching of hygiene is inspected and reported on every year by a medical man appointed by the Department.

Courses of hygiene, both theoretical and practical, have also from time to time been arranged for acting teachers.[2]

In a few years, therefore, practically every teacher in Scotland will have had some more or less systematic instruction in the hygiene of school life.

Physical Training.

An immediate result of the Physical Training Commission's Report was the appointment of an inspector of physical training for Scotland. His annual reports are incorporated in the annual reports of the Chief Inspector of Schools.

The inspector of physical training is responsible for the inspection of the systems in force all over Scotland—in the training centres for teachers, in the junior student centres, in the higher grade schools, in the elementary schools.

Briefly, the system now favoured is the model course prepared by an Inter-Departmental Committee some years ago.[3] The general effect of the course, as directed in Scotland, has been to displace the old drill instructor by a scientifically trained teacher. In the larger towns, and in the larger counties, there are specialist teachers, who sometimes act also as superintendents of physical training. This class of officer will continue to increase. Women are frequently preferred to men for the training of children.

[1] Mackenzie, W. Leslie: "General Report on Teaching of School and Personal Hygiene to students in training as teachers in Scotland." London: Wyman, 1907. [Cd. 3443.] 1d. See also Blue Book.—Mackenzie, W. Leslie, and Foster, Capt. A.: "Memorandum on Systems of Physical Training and their relation to the Personal Hygiene of School Life."

[2] See H.M. Chief Inspector's Annual Reports.

[3] Syllabus of Physical Exercises for use in Public Elementary Schools. London: Wyman, 1904. Price 9d.

Dunfermline College of Hygiene.

But the means of training either men or women teachers of physical exercises is limited. In Scotland, the one institution hitherto recognised as a "central institution" by the Scotch Education Department is the College of Hygiene and Physical Training set up by the Carnegie Dunfermline Trust.[1] The staff of the college (as yet only for training women in the whole course) includes two medical officers, five teachers certificated after extended special courses in theory and practice of the most modern physical training systems, one science graduate for anatomy and experimental science, one professor (visiting) of psychology and principles of education, a teacher of elocution, and a teacher of swimming.

It is expected that the college will provide a highly qualified type of teacher. Physical training will thus be doubly safeguarded—on the one side by the skill of a well-educated teacher, on the other by the medical inspector of school children. Thus by a long road we may move towards the ideal set before us by the Scottish Commission.

Feeding of School Children.

By the Education (Scotland) Act, 1908, the school boards received power to provide out of rates plant and service for the preparation of food; but no power to provide food itself out of rates. The children must pay for the food supplied. There is, however, an exception. When, by medical inspection or otherwise, a school child is found filthy or verminous or is unable by reason of lack of food or of clothing to take full advantage of the education provided, the parents may be prosecuted under the Children Act for cruelty; but the child must be cared for by the school board if no voluntary agency undertakes to care for it.

Feeding of school children, therefore, is not on the same footing in Scotland as in England. The method of dealing

[1] See Annual Reports of Carnegie Dunfermline Trust and Annual Reports by the Medical Officer.

with neglected children aims at maintaining the responsibility of the family for the child's fitness; but the ancient method of the Poor Law is discarded. The parent may be imprisoned, but neither he nor his child becomes a "pauper." In this matter, the Scottish Act follows the same principle as the Minority Report of the recent Royal Commission on the Poor Laws. The Education Authority, not the Poor Law authority, is made responsible for the maintenance as well as for the education of the child. Experience of the new method is not yet available in any great degree. But one can see here a very important new departure in Scottish administration. The education authority is now admitted into the family—I do not say home—on a new footing—the footing of a medical authority, with power to demand that a child shall be sent to school clean, fit, and clad. The hygiene of an average environment for an average individual is yielding to the hygiene of a concrete environment for a concrete individual.

A great deal of "feeding" is done by voluntary agencies, which have, no doubt, prepared the way for the powers now legal. Probably, also, the voluntary agencies have helped to prepare the destitute claimants. It will be interesting to watch the fight between the two methods—one resting on sporadic voluntary service, the other on systematic operation of a corporate body otherwise responsible for converting every child into a citizen.

Masses of confused "facts" can be obtained from yearly "reports"; but the "facts" are of little value for science; they are intended to bring subscriptions. In at least one city, a proposal by a school board to provide plant and service for preparing food for sale led to the usual "row" between the individual vested interest and the common good. But the plant and service are to be provided. In many elementary schools in Scotland, as well as in many secondary schools, the children can buy a good and cheap meal prepared by the school board staff. The new Act will certainly lead to a vast expansion of the practice.

Schools for Mentally and Physically Defective.

No adequate investigations yet enable us to estimate how many "defective" children there are in Scotch schools. The figures of the Commission on the Feeble-minded[1] were mainly collected in Glasgow—not a typical Scotch community. But exact numbers are not important; we know that the number of defectives is large.

In Glasgow some twelve years ago, classes were started for defective children, and there are now several special schools, with some hundreds of children either mentally or physically enfeebled.

In Edinburgh the movement was begun later. Three years ago one special school for eighty children—forty physically and forty mentally defective—was opened, and the school board propose shortly to provide two more such schools.

In other parts of Scotland little has been done. There are two homes for imbeciles; but these are for a lower mental grade than the ordinary education authority has to treat.

Much remains yet to do, especially for the adolescent defective. But the general mind is awakening to the need, and the mental specialist is providing some direction for those interested in the remedy.

Skin Diseases Schools.

The Edinburgh School Board are in course of establishing a Special School for Skin Diseases—the first, so far as I am aware, in Scotland.

Open-air Schools.

So far as I know, no open-air school, as such, has yet been established in Scotland. The Edinburgh "special" school is largely conducted on the same principles; but no experiment of the Charlottenburg type has yet come to

[1] Report of the Royal Commission on the Care and Control of the Feeble-minded. London: Wyman and Sons.

my knowledge. The Holiday Home School at Humbie, in East Lothian, is capable of development on "open-air" lines. Opinion is rapidly ripening, and it is probable that even the Scottish climate will shortly be brought into the service of an open-air school.

General Results and Conclusions.

The system of medical inspection is too young yet to yield massive results. Some important quantities there certainly are; for instance, the two reports of the Edinburgh School Medical Officer, the four reports by the Dunfermline Carnegie Trust Medical Officer, and some special reports on eyes. But the quantities are not adequate as a groundwork for national conclusions. The Special Report[1] on 72,857 Glasgow children and their relation to housing is one of the most important statistical documents now available for a study of the sociology of the school child. In this Blue-book (of 70 pages) will be found, elaborately classified and tabulated, the heights and weights of nearly 73,000 children—36,883 boys, 35,974 girls. Some seventy-three schools are concerned—Group A (twenty-six schools) in the poorest districts; Group B (twenty-seven schools) in the poor districts; Group C (eleven schools) in a better-class district; Group D (nine schools) in a still higher-class district. The heights and weights are classified according to locality, age, and the number of rooms in house. The Physical Training Commission's Report contained some tables correlating height and weight with rooms in house; but the numbers were too small for reliable inferences. In the Glasgow Report the numbers are large, and the document is accordingly more valuable as a reference-book.[2]

[1] See Blue-book [Cd. 3637]. Refer to reference list at end of chapter.

[2] The general results of averaging the age-average weights in Tables 61 and 62 are, certainly, in conformity with the results at each age; but the method is open to the criticism that the averages "totalled" are not all on the same plane. This criticism does not apply to the average heights and weights at each age-group. The facts for each age are sufficiently striking; for instance, between children of 10 years in Group A and children of 10 years in Group D, the average difference in weight is 3.2 lbs.; in height, 2.5 inches. For children of 14 years, the differences between Group A and Group D are: Weight, 5.1 lbs.; height, 3.8 inches.

Quantities are the temptation of every medical officer. They are important, but they are an instrument, not an end. In public health they have misled many men into a waste of the time and energy that should have been given to the concrete cases themselves. It is so easy to be satisfied with an average and to forget that the end—the only end worth thinking about—is to make the individual child fitter for the strains of living. As in public health, so in medical inspection, there are some signs that the living child is beginning to be lost in the maze of dead figures.

REFERENCES.

The following works may be recommended for reference:—

MACKENZIE, W. LESLIE, AND MATTHEW E.: "The Medical Inspection of School Children." Edinburgh and Glasgow: William Hodge and Co., 1904. 10s. 6d. net.

MACKENZIE, W. L.: "The Health of the School Child." London: Methuen and Co., 1906. 2s. 6d.

MACKENZIE, W. LESLIE, AND FOSTER, A.: "Report on a Collection of Statistics as to the Physical Condition of Children attending the Public Schools of the School Board of Glasgow, with relative Tables and Diagrams." Scotch Education Department. [Cd. 3637.] Edinburgh: Oliver and Boyd, 1907. 10½d.

MACKENZIE, W. LESLIE, AND MEIKLE, J. H.: "School Hygiene and Medical Inspection in relation to Tuberculosis in Children" in "Tuberculosis in Infancy and Childhood." Edited by T. N. Kelynack, M.D., p. 312. London: Bailliere, Tindall and Cox, 1908. 12s. 6d. net.

PHILIP, R. W.: "Tuberculosis among Children in Scotland" in "Tuberculosis in Infancy and Childhood." Edited by T. N. Kelynack, M.D., p. 192. London: Bailliere, Tindall and Cox, 1908. 12s. 6d. net.

In addition to reports mentioned in the preceding chapter see :—

Annual Reports of the School Medical Officers.

Annual Reports of the Local Government Board for Scotland.

Annual Reports on the Medical Inspection of School Children in Dunfermline. (Dunfermline Carnegie Trust.)

Annual Reports of the Scotch Education Department.

XX

MEDICAL EXAMINATION OF SCHOOLS AND SCHOLARS IN IRELAND

BY

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IRISH schools may be divided into the following groups:—

1. *Primary (National) Schools*, under the control of the Commissioners of National Education.
2. *Industrial Schools.*
3. *Preparatory Schools*, under private management.
4. *Intermediate Schools*, under various boards and trusts or in private hands. This class includes schools both of the "Grammar School" and the "High School" class. They are mainly engaged in preparing pupils for the "Intermediate Examinations," which have played so large a part in recent Irish education.

With regard to the medical examination of schools and scholars in Ireland, the subject may be best considered by dealing with the problem as presented in the above school groups.

Primary or National Schools.

Of these schools there were on December 31st, 1908, 8,468 in operation, affording accommodation for 753,321 pupils, allowing ten square feet of floor for each pupil. The number of pupils on the rolls for the previous year was 708,992, and the average attendance was 494,662, the percentage of average daily attendance of pupils being 69.8.

These schools are partly "vested" (*i.e.*, vested in the commissioners or in trustees), partly "non-vested," a distinction which is most important from the administrative point of view, but which does not concern our present purpose. It is surprising to learn that of these schools no less than 5,455 (*i.e.*, over 60 per cent.) possess but one room. The explanation of this extraordinary anomaly is that in most cases the school is an appanage of a church or chapel and is used not only for educational but for religious purposes, a system which was originally intended to be national and non-sectarian having become gradually thoroughly sectarianised, to the great injury of education. Of the remaining schools, 2,010 are described as possessing "two rooms, or a room and a class-room," while only 408 schools possess "three or more rooms."

In close association with the "National" schools are the "Model" schools, of which there were thirty in operation in the year 1908, with an average number of pupils on the rolls of 9,016, and an average daily attendance of 6,875. These schools approximate somewhat to the type of "communal" school of France and Germany, and are not in connection with the churches.

The Condition of the National Schools.

The state of the school premises varies greatly in different parts of the country. The schools erected during the last few years are in general excellent, and in many cases up to the highest modern requirements. These schools constitute, however, a very small minority. Of the older schools some are good; a fair number are deficient

but tolerable; many are badly constructed, ill-kept, ill-ventilated, and imperfectly heated; while not a few are in a condition which can only be described as constituting a grave danger to the public health and a scandal on Irish civilisation. Public opinion has lately been much roused on this question, and there can be no doubt that a fair amount of progress is going on, but it may be questioned whether a satisfactory result can be attained while the present defective system of administration continues in operation. What is wanted is to make the local authorities responsible for primary education, and to stimulate public opinion so as to ensure that they shall do their duty. It is surely a ludicrous anomaly that a wealthy and progressive municipality like that of Belfast should control its water, gas, electricity, sewerage, tramcar system, markets, technical schools, lunatic asylums, and fever hospitals, and have no direct control over its primary schools. And what is the result? I quote from the Appendix to the "72nd Report of the Commissioners of National Education in Ireland (1905-6)":—"It is a curious fact that a prosperous and progressive city such as Belfast, rivalling as it does the most thriving seats of industry in Great Britain, should, nevertheless, be the most backward part of the British Isles in the matter of school accommodation." The report goes on to show that many of the Belfast primary schools are badly constructed, overcrowded, lacking in classroom accommodation, in lavatory accommodation, and in playgrounds. It is deplorable to have to record that one-third of the Belfast primary schools have no playgrounds, and that the pupils are reduced to the wretched alternatives of either eating their luncheons and spending their period of recreation in their school-rooms, or being turned out into the streets. As regards Dublin, the same report says:—"There are a considerable number of old buildings, so old and so unsuitable to modern requirements that one remedy only is possible, viz., to replace them by new houses. There are many of these unsuitable houses in the city of Dublin—one in the crypt of a church, badly lighted, heated, and ventilated, and another in an

old dwelling-house whose former drawing-room is the school-room."

The premises are not only in many cases badly constructed and unsuitable for educational purposes, but they are too often imperfectly heated, badly ventilated, and dirty. Lavatory and cloak-room accommodation is in many cases most defective. It will sound incredible, but it is nevertheless painfully true, that in many cases, especially in rural districts, no provision is made for heating the premises, and either the teacher pays for fuel or the children are required to bring "turf" to burn, or there is no heating at all. That this should be possible in the twentieth century "gives one furiously to think," as the French say.

Medical Inspection of National Schools and Scholars.

This does not exist in Ireland. The recent Act making such inspection compulsory in England does not extend to Ireland. The only inspection is that by the inspectors of the National Board, who are not medical men, and who cannot be supposed to be experts in hygiene. They have in recent years been laudably frank in condemning the structural defects of the existing schools, but on the no less pressing question of the medical inspection of scholars they appear to be silent. Educational authorities in control of primary education in Ireland appear to be strangely blind to the evil effects upon the health of the children of overcrowding, bad ventilation, insufficient heating and lighting, defective cloak-room, lavatory, and playground accommodation. They need to be roused to the dangers of depressing the physique of the children by the above conditions, of laying the seeds of tuberculosis and other diseases, and of affording breeding-grounds for the propagation of infantile infectious maladies. There can be little doubt that epidemics of measles, whooping-cough, scarlet fever, and other diseases derive no small part of their intensity from overcrowded and insanitary primary schools.

The only medical inspection which Irish primary schools obtain is from the local sanitary officer. To him a school is simply "a house," or "a building." He can enter it at his own discretion, he can command the abatement of nuisances, he can close a school which he regards as dangerously unhygienic or grossly overcrowded. These powers are a poor substitute for periodical medical inspection, but they are better than nothing and should be fearlessly exercised.

The Teaching of Hygiene in Primary Schools.

Some beginning in the teaching of hygiene has been made in Irish primary schools, but only in a very tentative way. The difficulty is that the teachers themselves do not understand the subject, and that there is no adequate machinery in operation for their instruction.

General Conclusions as to Hygiene of Primary Schools.

The following caustic summary of the defects of Irish primary schools from the point of view of hygiene has been furnished to me by an ex-inspector under the National Board, a gentleman of large experience and wide knowledge of educational methods, home and foreign, who acted as an inspector for a long course of years in various parts of Ireland: "The health of the pupils in general is unsatisfactory. The mortality amongst them is probably higher than the high mortality of the Irish population generally. Epidemics of measles, scarlatina, and whooping cough are extremely frequent. The eyesight of the pupils is apparently deteriorating somewhat. The teeth are greatly neglected—entirely so. Health conditions are very unsatisfactory in view of the open-air surroundings of the bulk of the population; only for this the mortality would probably be much higher. Is this due to poverty? Partly, no doubt, but also to insufficient and unsuitable food (potatoes eaten three times a day; no porridge) and insufficient clothing. High mortality, probably largely

due to schools which in Belfast are grossly overcrowded and insanitary in many cases; in the country they are often old, decaying, and rat-infested, with low ceilings and hardly any ventilation, imperfectly heated, imperfectly lighted (straining the sight). Two things are especially injurious—the vicinity of out-offices (contaminating the air and, even if not communicating disease, lowering the vitality of children by vitiated atmosphere, so as to render them incapable of resisting infection), secondly, want of cloak-rooms (cloaks and hats, dripping wet, are frequently heaped on one another, carrying germs from one to the other). The schools, being appanages of churches (which are usually built on an elevation in country districts), very frequently adjoin or are built into graveyards (and usually on the slope below graveyards). The details are too often shocking. This, again, saps vitality. The desks in use are primitive, nearly always too high, and strain the backs. Tuberculous disease is almost certainly fostered by the vitiated air, and the seeds of disease or predisposition implanted. The Board has a law adviser, but no medical adviser."

Is it any wonder that "there is a tear in the eye of dark Rosaleen?" Is it in any way surprising that the tuberculosis rate of Ireland is one of the highest in the civilised world? Is it a marvel that the tide of Irish emigration still flows towards the West? What are our governors, politicians, and social reformers about? It is idle to lay all the blame on the Board of National Education. It is struggling, perhaps not always manfully but still sincerely, with an antiquated and impossible system. Nothing but a root-and-branch reform will save Irish primary education from its present appalling scandals and deficiencies. Popular control and local financial support are absolutely essential.

Industrial Schools.

There are sixty-six industrial schools in Ireland, caring for 8,424 children at a cost of £98,681 to the Treasury and of £42,978 to the ratepayers. These children are

taken from the less favoured classes of society, whose surroundings are such as to render them a probable prey to evil influences. The children are housed, clothed, fed, and educated up to the age of 16, when they leave the schools to commence to earn a respectable livelihood. The premises of these schools are in general good, and the hygienic conditions satisfactory. The course of instruction includes a syllabus of Labour Science for boys and of Domestic Science for girls. The former includes instruction in the following subjects: The nature and uses of the soil, plant life, air, water, sunlight: their influence on plants and animals; the construction of dwelling-houses and outhouses; a knowledge of food suitable for man and beast; the theory and practice of agriculture, manual instruction, and the various trades. Domestic Economy includes instruction in the following: The home and housework, food, kitchen work, housekeeping, needlework, dressmaking, laundry-work.

Lady Aberdeen has established boys' and girls' guilds of health in connection with the industrial schools, a step from which good results may be confidently anticipated.

The reports of Mr. John Fagan, the Government Inspector of Reformatory and Industrial Schools in Ireland, are very instructive reading, and encourage the hope that good progress is being effected in regard to these schools.

Preparatory Schools.

We may dismiss in a few words the subject of Irish preparatory schools. These are intended for young children of the well-to-do classes in preparation for the intermediate schools. These preparatory schools are in many cases excellent. Many of them are established in localities specially favoured from the health point of view, and the conditions of life are approximated to those of a well-ordered private household. A doctor is always attached to the school, and while periodical examination of pupils is unusual, practically every case of departure from health receives prompt and skilled attention. The

premises are in general good, and kept in satisfactory order. The food of the pupils is well cared for.

Intermediate Schools.

The intermediate schools of Ireland, which include schools both of the "Grammar School" and the "High School" class, present many varieties of premises, equipment, and efficiency. A few are wealthy and splendid corporations, not unworthy to rank with the great schools of England and Scotland. Many are well housed, well equipped, and well administered. Many, again, are of mediocre quality from every point of view. Some are situated in the centre or on the outskirts of the large towns; others in the smaller towns and villages; others, again, quite in the country. The large demand in recent times in Ireland for education of the "intermediate" type has led to a large increase in the number of schools, which has not always made for efficiency.

In general it may be said that in schools of this class the premises are in good or fair order; there is sufficient air space per scholar; heating, lighting, and cleanliness are adequately attended to, and there is efficient medical service. The school furniture in many schools is antiquated and based on wrong principles. There is no systematic periodical medical inspection of schools or scholars. The Intermediate Board has recently appointed inspectors, amongst whose duties is the obligation to have regard to ventilation, overcrowding, etc. These inspectors are, however, not medical men, and their main duties are scholastic. Except in a very few cases, no health schedule of pupils is kept. Cases of infectious disease are in most cases treated in an infirmary attached to the school, but in the large towns it is becoming more the practice to send such cases to the fever hospitals—a practice which should be encouraged. The daily life of the pupils in boarding schools of the intermediate class is in general well-regulated. About twenty-eight hours per week in class and twenty-eight hours spent in preparation is the

average amount of work. In Irish schools there is usually no school-work done before breakfast, a point of distinct advantage from the health point of view, as compared with English schools. Games are not actually compulsory in all Irish schools, but they are much encouraged by the heads of schools. They are pursued with avidity by the pupils, and practically every pupil plays games, except there is some physical disability. Football is the favourite game for boys, hockey for girls. Accidents at football are of frequent occurrence, but they are rarely of a grave nature, and few heads of schools regard them seriously. Pupils are not examined medically before being allowed to indulge in games, but any indication that a game is too much for the pupil's strength receives prompt medical attention.

There is little systematic teaching of hygiene in Irish Intermediate Schools. The iron pressure of the Intermediate system taxes the resources of heads of schools to the utmost to find time for all the ordinary subjects, and the introduction of any new and unaccustomed subject would probably be viewed with hesitation. There is the further difficulty that few, if any, of the present staff of teachers are qualified to teach hygiene. Yet its omission must be regarded as a blot upon the system. Oddly enough, while hygiene is neglected in boys' schools, some attempt to teach the elements of the subject is made in many girls' schools. In some cases it forms part of a course upon cookery!

Drill, gymnastics, and calisthenics are cultivated in most Irish schools, but a good deal of difference of opinion exists as regards their value. Some experienced "heads" prefer to lay the stress upon games which are pursued in the open air, and are attended by pleasurable excitement, rather upon a mechanical drill or a hardly less mechanical gymnastic. Drill is in general unpopular with boys.

Over-Pressure in Irish Schools.

Some difference of opinion exists as regards the existence and the extent of over-pressure in Irish schools.

Probably a large majority of teachers are of opinion that the evil is either non-existent or negligible. It is affirmed that boys, at any rate, are rarely inclined to over-work themselves, that they have a large capacity for idleness, and that the prevalent cult of outdoor games goes far to keep the claims of study within due bounds. Mr. T. G. Houston, of Coleraine, whose opinion is entitled to much respect, takes the opposite view. He is of opinion that over-pressure exists, that it is a serious evil, that it falls chiefly upon stupid boys who are pressed to achieve results of which they are naturally incapable, but that bright, clever, and ambitious boys, who delight in their work, are also sufferers.

The question is one with regard to which the point of view of the physician and that of the schoolmaster are apt to be different. The former is struck by the cases of over-pressure which arise in his experience, the latter rather by the rarity of such cases, in proportion to the number of pupils. Some grave cases of over-pressure have occurred in the writer's practice. They have been chiefly in girls, and they have been the result of culpable excess in the hours of work, deficiency of sleep, and neglect of outdoor exercise and recreation. The young brain will stand a great deal of hard work, not only with impunity, but actually with advantage, provided always that (*a*) the boy or girl gets from eight to nine hours of sleep every night; (*b*) that not less than two hours daily are spent in the fresh air; and (*c*) that wholesome food in sufficient quantity is taken.

Necessary Reforms in Irish School Education.

The following reforms in Irish school education seem to be essential:—

(1) The primary schools should be put under popular local control, and a sweeping reform regarding premises and hygienic conditions should be effected; (2) all schools and scholars should be subject to periodical medical inspection; (3) a health schedule should be kept of every pupil, in

which should be noted the height and weight, the condition of sight and hearing, the state of the teeth, the condition of the heart and other important organs, the games in which the pupil may or may not indulge, and any constitutional peculiarity; (4) systematic teaching of hygiene should be enforced, and steps should be taken to institute courses of lectures and other methods for instructing school teachers in this subject; (5) Ambulance or First-aid classes should form a necessary part of school routine.

REFERENCES.

A list of Irish schools—Primary (National), Industrial, and Intermediate—will be found in the Annual Reports of the Commissioners for National Education in Ireland; of the Inspector of Reformatory and Industrial Schools; and of the Commissioners of Intermediate Education in Ireland. Dublin: E. Ponsonby.

The following official Reports may be consulted:—

Royal Commission of Enquiry into Primary Education (Ireland). Reports and evidence of the Commissioners, 1870; later Report, 1897.

Annual Reports of the Commissioners of National Education (Ireland).

Annual Reports of the Commissioners of Intermediate Education (Ireland).

Annual Reports of the Inspector of Reformatory and Industrial Schools (Ireland).

The following works may be consulted for information relating to school education in Ireland:—

Balfour, Graham: "Educational Systems of Great Britain and Ireland." Clarendon Press, 1903. 7s. 6d. net.

Doyle, Thomas: "Essay on the Education and State of Ireland." 1880.

Fitzgibbon, G.: "Irish National Education." Dublin: 1868.

GODKIN, J.: "Education in Ireland from the earliest times to the present." Dublin: 1862.

HEALY, J.: "Insula Sanctorum et Doctorum; or, Ireland's Ancient Schools and Scholars." Dublin: Sealy, 1901. 7s. 6d.

HIME, M. C.: "Home Education. Irish *versus* English Grammar Schools." London: Simpkin, 1887. 3s. 6d.

HOUSTON, T. G.: "School and Home." Mayne and Boyd. Belfast: 1895.

JACQUES, —: "Irish Education—Primary, Secondary, Technical, and University—as it is and as it should be." Dublin: Gill, 1906. 1s. net.

MILLER, J. H. D.: "Clerical Education in Ireland: a Plea for Popular Control." Dublin: Maunsel, 1907. 4d. net.

O'BRIEN, R. B.: "Fifty Years of Concessions to Ireland, 1831-1881." London: Low, 1883. 16s.

O'DONNELL, F. H.: "The Ruin of Education in Ireland." London: Nutt, 1902. 5s. net.

PLUNKETT, SIR HORACE: "Ireland in the New Century." Pop. edition. London: Murray, 1905. 1s. net.

XXI

MEDICAL EXAMINATION OF SCHOOLS AND SCHOLARS IN WALES

BY

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WALES is a land of mountains, and Owen M. Edwards has well said in describing their influence on the national life and characteristics of the people: "The mountains gave them community of ideas and of aims before combined action became possible. The wild and rugged outlines of the mountains are mirrored as intense but broken purposes in the Welshman's character, always forming great ideals, but lacking in the steady perseverance of the people of the plain. The mountains strengthen his imagination. His imagination makes him impressionable —he has always loved poetry and theology."[1] This tersely describes some of the racial characteristics of the Welsh and explains in a measure why the education problem has been different in Wales from that of England. The Welsh people are sprung from two stocks—the Iberian, the older race of the two, found chiefly in South-East Wales, is a dolico-cephalic, swarthy type of short stature; and the true Celt, who is tall, fair-haired, and blue-eyed.

[1] EDWARDS, OWEN M.: "Wales," in the Story of the Nation Series. London: Fisher Unwin, 1901. 6s.

Early Sanitary Conditions in Welsh Schools.

The first record regarding schools and scholars of Wales is found in a Government Report issued in 1848.[1] This Report reveals a terrible state of things as to the physical and moral degradation of the Welsh people, and its conclusions were at the time commonly supposed to be a gross exaggeration of the facts, owing to the fact that all the Commissioners were dealing with a country of which they were entirely ignorant of the language of the people; but as regards the sanitary state of the schools it is doubtless a true picture. The Report asks, as regards school buildings:

Is Light Essential? In several schools there were large holes in the floor some half a foot deep. "The room was so dark that the children were obliged to go to the door and open it so as to have sufficient light to read. In some cases the crypt of a church was the school-house."

Is Ventilation Essential to Health? "One room gave a hot, sickening smell like the engine on board a steamer. One school-room, which at six square feet per child is calculated to hold twenty-eight, I found to contain fifty-nine children." On the present basis—*i.e.*, ten square feet per child—that room would be sufficient for seventeen children. They found 50 per cent. of the schools without sanitary conveniences of any kind.

This same Report, however, reveals the first instance of a medical officer controlling school attendance. In the rules of a school at Abersychan it is laid down that no children living in a house where there was an infectious disease were allowed to attend school until the medical officer said it was safe to do so.

Conditions prior to Medical Inspection.

Wales has advanced much since those days, and amongst her people there is an intense devotion to education, for which there is abundant proof, *e.g.*, the pence of the colliers and quarrymen enabled the first University College at Aberystwyth to be opened.

[1] Report of Inquiry into Education in Wales for the Committee of the Council of Education. London: William Clowes and Sons, 1847. (Out of print.)

Prior to 1907 very little had been done by the Welsh School Boards in looking after the physical well-being of the children. Swansea had two medical officers, who visited the schools, tested sight and hearing, looked after the teeth of the children, and examined any special cases brought to their notice by the teachers. In Pembrokeshire the school medical officers reported any epidemics or defective children, whilst at Pembroke two local doctors were paid a small salary for school attendance purposes. At Barry there was a school nurse, who treated minor ailments, and the teachers tested the sight of the children, referring the defectives to a local medical man appointed for the purpose. Nowhere had any actual measurements, etc., been taken, though the Guild of Graduates of the University of Wales 1905 started a Welsh anthropometric survey of adults between the ages of 20 and 45 years. The Report gives an excellent schedule for use in such an inquiry.[1]

Welsh Education Authorities.

Most of the local education authorities have sought in some measure at least to comply with the requirements of the Act of 1907. In Wales and Monmouthshire the authorities are: County councils, 13; county boroughs, 4; municipal boroughs, 4; urban councils, 8—a total of 29. Of these, all except seven county councils have complete schemes in operation, and these seven are arranging for such.

There are employed in the School Medical Service of Wales 125 medical officers. Of these fifteen are whole time medical officers of health, who are also school medical officers; four are whole time school medical officers who are not medical officers of health; thirteen are whole time assistant school medical officers; and there are ninety-three part time medical officers of health and assistant school medical officers.

So far only four counties have appointed county medical

[1] Report of University of Wales: Guild of Graduates. University of Wales Office, Cardiff, 1905. (Privately printed.)

officers of health, who, of course, are also school medical officers, and in one county (Carnarvon) there are three such officers. The Housing and Town Planning Act will necessitate the appointment of county medical officers of health in all the other nine counties. Five medical women are acting as assistant medical inspectors, three of these being whole time medical officers. In many counties the part time district medical officers of health do the work, one being appointed to superintend and prepare the reports.

School Nurses.

About twelve education authorities employ school nurses, and so far about fifteen nurses are employed. Most of them are whole time, but in two counties—Flint and Montgomery—the district nurses do the work. In addition there are in Wales six women health visitors, some of whom assist in the school work. The duties of these nurses consist in helping the school medical officers, and in following up at the homes any defects found on examination and in advising the parents, as well as attending to cleanliness of the children. At Cardiff, Merthyr, and Barry the nurses also do some amount of slight treatment under medical supervision.

Numbers of Children and Teaching Staff in the Public Schools.

The number of children in average attendance in primary schools is 373,469, whilst in the secondary schools of Wales there are 12,962 pupils. In Wales the "provided" schools largely predominate, and with regard to secondary education, there are now 104 schools, 95 of them being under a special Welsh intermediate school scheme. Of these schools, eight are boys' schools, twenty-one are girls' schools, whilst fifty-six are dual schools. It will thus be seen that the system of co-education is largely in use in Wales in secondary education. The intermediate schools are very efficient, and are educating 6.2 per 1,000 of the population of Wales. The children in the primary schools do not attend as regularly as they do in England.

In England 88.5 indicates the average attendance, as compared with 86.6 in Wales. This is due to the more scattered population, long distances from school, and perhaps also to a larger proportion of the children under five attending school in Wales than in England. This inferiority does not, however, apply to the best of the town districts, the percentage of average attendance being equal to the best among the English towns.

For every 1,000 scholars there are: Certificated teachers, 14.49; uncertificated teachers, 12.03; other adult teachers, 6.60—being 33.12 teachers of all grades. As an instance of good staffing one might mention Barry, perhaps one of the best staffed of any school district. There the percentage of teachers who are certificated reaches 83.8, whilst there are 31.8 certificated teachers for every 1,000 scholars. The average size of class is 28.3 children for every assistant teacher.

The Organisation of Medical Inspection in Wales.

In the organisation of the work of medical inspection most of the authorities very closely followed the schedule of the Board of Education, and in most cases the 8 in. by 5 in. card has been adopted. Swansea, in addition, added the testing of colour vision, chest measurements, and number of vaccination marks. Three other authorities also record the vaccination state of the children, and though the Board of Education has issued a warning that such information should not be made use of by the vaccinating officer, I do not think that if due care is exercised, so as to keep the information confidential, there can be any objection; and on the other hand it is highly important to have statistics available as to the state of immunity of the child population of a district with regard to variola as it is for any of the other infectious diseases.

It is interesting to note that though the Board of Education only required the examination of "entrants" and "leavers" in the first two years, the Swansea authority appointed twenty medical men for the first year only, so as to have every child in the schools fully examined.

Rural and Urban Children.

Anyone familiar with Wales must be struck with the difference in physique of the children in rural Wales compared with the large towns. One can expect that in rural Wales the standard would be higher, but the reverse is the case.

Contrasting the children of rural Cardiganshire with the populous towns of Glamorgan, the more "delicate" appearance of the country child is conspicuous. Possibly this is, at least in part, due to the diet. Unfortunately in the country parts of Wales the children are largely being fed on tea and white bread and butter. Dr. Walter Ll. Davies, Cardiganshire, states: "The home circumstances of the children in the rural districts were far from satisfactory. The houses in a large number of cases were damp, dilapidated, and ill-ventilated. The diet consisted of tea, bread and butter, bread and milk, porridge, bacon, pork, and broth. Butchers' meat was a rarity." Again, Dr. C. E. Humphreys (County Medical Officer, Montgomery), states that "he found 3.5 per cent. badly nourished children in the urban schools, against 5.2 per cent. in the rural schools." He attributes this to the "long distances the children have to travel with a hurried breakfast, often of tea and bread and butter only, with no substantial meal until the evening. Milk is actually scarcer for many months in the year in small country cottages than in towns. The staple drink is tea with nearly every meal, milk and porridge being rarely seen." Contrast this with the statement of Miss Callis, one of the women inspectors of the Board of Education, who had been visiting the Welsh schools[1]: "The Barry schools, and some of the Cardiff and Swansea schools, where the children are robust, vigorous, and *alive*. Partly, of course, due to natural advantages of position, nearness to sea and country, etc."

Defects of School Children.

Though it is difficult to obtain data as to the defects

[1] Report on Children under Five Years of Age by Women Inspectors of Board of Education. [Cd. 2726.] London: Wyman and Sons Ltd., 1905. 8½d.

found amongst Welsh school children, there are statistics which show a considerable amount of defective vision—*i.e.*, $\frac{6}{18}$ or worse, among those leaving school. The percentage returns of cases of defective vision are as follows: Flintshire, 15.8; Barry, 15.8; Swansea, 13.6; Cardiff, 10.9; Glamorgan, 6.1; Pontypridd, 4.6. As a rule the sight of the girls is worse than the boys. This may be partly due to the girls taking needlework. Practically no needlework, only knitting, should be taken in the infant schools, and such wrong methods as fine stitching and the counting of threads should be abolished.

Nearly all districts register a large amount of adenoids and enlarged tonsils. Whether this is because Wales is on the western seaboard with a greater amount of humidity than on the east coast of England, or whether it is in consequence of the large amount of teeth defects also found, requires further consideration.

Special Schools.

There are two schools for the deaf and two for the blind in Wales, being at Cardiff and at Swansea respectively.

Of the mentally defective schools there are four, whilst Mountain Ash has just started one in temporary premises. The school at Barry accommodates seventeen children, and one at Pontypridd is peculiar in that it is for girls only. Monmouth County Council is arranging in conjunction with some of the autonomous areas in the same county to open a similar school.

Provision for Treatment.

So far, beyond the treatment of minor ailments, sores, etc., by the nurses, very little has been done to remedy the defects found in the schools. Several authorities, among others being Barry, Carnarvonshire, Flintshire, Monmouthshire, and Swansea, have decided to supply spectacles free in deserving cases. Arrangements have been made with local opticians in Barry to supply spectacle from 2s. 6d. to 4s. to school children. A school clinic on a small scale has been started at Abertillery, and at Barry the

matter is under consideration. It would not be difficult to institute a complete clinic at Barry, as there is already a rate-supported accident and surgical hospital belonging to the Council. All the medical men in the town desirous of serving on the staff are paid for their services out of the rates. For treatment of defective eyes, hearing, teeth, and adenoids a contributory scheme on the lines of the public medical service, where each parent would pay 1s. a year for each child, would answer admirably and would very nearly be on the lines suggested in the Majority Report of the Poor Law Commission.

Undoubtedly to have the full benefit of medical inspection, attention should be paid to remedial work, but at the same time much can be done in educating the children, and more particularly the girls, in hygiene and domestic science.

Unfortunately, Wales is as yet behind England in its attention to these matters, but if the home-making centres now established at Penarth and Barry became general much benefit would accrue. There the girls are taught the whole of the work of the home, not merely detached courses in cookery and laundry, and both centres are doing excellent work.

REFERENCES.

As might be expected, at present but few references can be given to works or special reports dealing with the medical examination of schools and scholars in Wales. The first reports of many school medical officers have appeared, and should be studied, especially those dealing with such centres as Cardiff, Swansea, Barry, Wrexham, as well as the counties of Glamorgan and Monmouth.

The following works dealing with social conditions and educational problems in Wales may be of service for reference.

Borrow, Geo.: "Wild Wales." Everyman Library. London: Dent. 1s.

Bradley: Highways and Byeways of North Wales." London: McMillan, 1898. 6s.

Bradley: "Highways and Byeways of South Wales." London: McMillan, 1903. 6s.

Bradley: "Marches and Borderland of Wales. London: Constable, 1905. 10s. 6d.

Davies and Jones: "University of Wales." Cardiff: University of Wales. 5s.

See also: "Welsh Education." *National Magazine*, vol. i. Wrexham: Hughes. 6d. monthly.

Edwards, A. D.: "Children of the Poor" (Sketches of Child Life, chiefly in Wales). London: Hammond and Co., 1909. 1s.

Edwards, O. M.: "Hanes Cymru Rhan I." Carnarvon: Swyddfa Cymru, 1895. 1s.

Edwards, O. M.: "Wales." London: Fisher Unwin, 1901. 6s.

Evand, David: "Sunday School in Wales." London: Sunday School Union, 1883. 2s. 6d.

Giraldus Cambrensis. Everyman Library. London: Dent, 1909. 1s.

Jenkins, Austin: "South Wales and Monmouthshire Notes on Education." Cardiff Educational Publishing Co., 1909. 6d.

Jenkyn-Thomas: "Heroes of Wales." London: Horace Marshall, 1909. 1s. 6d.

Jones, David: "Life of Griffith Jones (Founder of Circulating Schools)." London: S.P.C.K., 1902. 5s.

Little, A. G.: "Mediæval Wales." London: Fisher Unwin, 1902. 2s. 6d.

Lleufwr, Thomas: "Welsh Land Commission." 1896.

"Methods of Infant School." (Papers read at a Conference at Cardiff.) Cardiff: *Western Mail* Offices, 1898. 6d.

Owen, R.: "The Kymry: their Origin and History." Carmarthen: Spurrells, 1891. 7s. 6d.

Phillips, Sir Thos.: "Wales Considered in Relation to Education. London: J. W. Parker, 1849.

Rhys, Sir John: "Celtic Britain." London: S.P.C.K., 1882. 3s.

Rhys, Sir John, and Jones, Sir D. Brynmor: "The Welsh People." London: Fisher Unwin, 1906. 5s.

Southall, J. E.: "Wales and her Language." Newport (Mon.): Southall, 1892. 3s. 6d.

Stephens, T.: "Welshmen: a Sketch." Cardiff: *Western Mail*, 1901. 3s.

XXII

MEDICAL EXAMINATION OF SCHOOLS AND SCHOLARS IN CANADA

BY

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ACCORDING to the terms of Confederation (B.N.A. Act), education is in the hands of the Provincial Parliaments.

Generally speaking, the average Canadian parent cares more about school taxes than he does about school hygiene. Climatic conditions, sturdy ancestry, and hitherto limited immigration have all contributed something to Canadian physique.

Efforts have been made to secure a recognition of the following: That the sanitary inspection of the schools is a State duty; that the medical inspection of school children is a legitimate and all-important part of school inspection; and that the Education Departments of Canada should take measures to protect the health of all its school-going children.

As a rule, residential schools are ahead of Government or public schools in the matter of medical examination. Nearly all such schools have physicians under whose supervision some examination at least is made.

Little, so far, has been done in Canada for physically or mentally defective children. In the Children's Hospital, Toronto, and at the Lakeside Home on the Island (the summer hospital of the same institution) a special schoolroom is provided for all the patients able to attend school,

and the Board of Education of Toronto sends a teacher. The question of provision for mentally defective children (and adults) has been brought to public attention in Halifax and in Montreal, and the Government of Ontario has ordered special reports and a census on this subject to be made. Three such reports have been presented, and the Hon. W. J. Hanna, Provincial Secretary for Ontario, has stated that the Government intends to prepare as soon as possible some plan for dealing with these unfortunates. The reports above-mentioned contain frequent references to children of school age who are feeble-minded.

Medical Examination in the Different Provinces.

New Brunswick, Nova Scotia, and Prince Edward Island.—I am indebted to Dr. F. V. Woodbury for the following facts: Two medical examiners were appointed for Halifax, at a salary of $250, in 1907, by the Board of School Commissioners, under authority granted by the Provincial Government. In 1908 all the children attending school in the city, numbering about 8,000, were examined. The two medical inspectors also examine all applicants for positions on the teaching staff and all cases of truancy where sickness is claimed, also any teachers applying for pensions or leave of absence. Ten dental examiners are appointed, and serve voluntarily. During 1908 they examined over 4,259 children. About 3,000 were found to have healthy mouths, about 1,000 unhealthy, and the remainder, over 200, very unhealthy; 943 had tooth-brushes, which were used less than once daily; 316 were mouth breathers; only 654 had no cavities; and there were approximately 13,000 unsound teeth, while 2,691 children had teeth which needed attention. The attitude of some parents was at first somewhat antagonistic, but all opposition stopped after the first year, and expressions of gratitude are now quite common.

There is some attention paid to medical inspection of schools in Prince Edward Island, and in New Brunswick a committee of physicians has been appointed to report on

the subject and efforts are being made to introduce such inspection.

Quebec.—Montreal is *facile princeps* in regard to its medical inspection of schools. The Quebec Board of Health, the local Boards of Health, and the Department of Public Instruction all issue sanitary regulations in regard to school houses, which are generally carried out. In Montreal the City Council inaugurated the medical inspection of schools in 1906, under the direction of the Committee on Hygiene and Statistics. The School Board on several occasions made suggestions for improving the school medical service and finally, repeated exclusion of pupils from school, sometimes for long periods, induced the School Board to take such steps as it could to effect a remedy. There was need of close touch with the homes and constant supervision of the children found to be suffering from certain forms of infection, pediculosis, scabies, etc. This could be effected only by the employment of trained nurses, who, acting as assistants under the direction of the medical inspectors, would keep these defective children under constant supervision, visit their homes, and instruct mothers in the application of the treatments necessary. In March, 1908, at a salary of $600 each, two trained nurses of the Victorian Order were engaged by the School Board at its own expense to serve as assistants to the inspectors in eight of the public schools. The nurses are supplied with a card index "follow-up" system for each school, by the aid of which each child is followed from the time of diagnosis until a cure is effected. By this means the work of the inspectors is made effective with a minimum of loss in schooling. There are about 6,000 pupils in the eight schools visited by the nurses. No measurements are taken in the Montreal schools. There is a number of different school boards in Montreal. The nurses are employed by the Protestant Board of School Commissioners.

Medical inspection of schools was begun in Montreal for its 60,000 school children, through the efforts of a committee of the Montreal Women's Club, first appointed

in 1902. After four years of education and agitation they had the satisfaction of seeing a system inaugurated by which fifty physicians, at $25 a month, gave an hour or two a day to inspection. This was changed in 1908 to the present system. There are no facilities such as baths, etc., in Montreal schools, so the nurse's work is principally done in the homes of the scholars. A large nursing staff is needed in this city of varied population, and more than all a compulsory system of education is required. It is impossible to reach defective children as long as the voluntary system prevails. Physically defective children are being cared for in a small way by a philanthropic Protestant charity, and a larger movement is about to be organised to collect such children and drive them to the school which is hoped will be erected on the mountain-side —but the mentally defective are yet uncared for.

The city of Montreal is now divided into seventeen districts for the purpose of medical inspection; in each district a physician has been appointed who receives $1,000 a year, and must give all his time to the city between 9 a.m. to 5 p.m.

Every day they must visit each school of their district and at this daily visit they see only children that the principals may think affected by some contagious diseases, or the children who, after an absence more or less prolonged, come back to the school to be re-admitted. They have instructions to answer any call from the principals of the schools. They report monthly, and when anything especial happens they may report daily at the office of the Infectious Diseases Department.

This work has been carried on for three years with the best results, and a director of a school of 1,500 pupils stated some time ago that he considered it impossible to direct his school without a medical school inspector. The number of transmissible diseases has decreased wonderfully. " Children are cleaner, so that we now never send a child home for want of cleanliness. At the time of the first inspection in 1906 it was found that most of the buildings had the sweeping insufficiently and badly done

(dry sweeping) in half the cases; in the class-rooms tables and chairs were so badly disposed that the light came to the pupil from the right, and in some cases from the front of the pupil. In 1906 only sixteen schools had a good system of ventilation in operation; most of the schools were not protected against fire. Now all the schools are sufficiently protected in case of fire except a few private schools. In all classes the light comes from the left of the pupils, and the sweeping is done every day with damp sawdust; all the schools are properly ventilated, and in some of the old ones a system of ventilation has been installed."

The medical inspectors begin now to deliver lectures in the schools of their district: this seems to give good results.

Ontario.—The Public School Act was amended in 1909, giving the power " to provide and pay for such dental and medical inspection of the pupils as the Regulations may prescribe, or, in the absence of Regulations, as the Board may deem proper." There are also numerous references in the Regulations for the guidance of inspectors and teachers as to sanitary matters and matters of health and disease.

Hamilton has a medical inspector of schools—the City M.H.O., Dr. Roberts—and also a school nurse. Brantford has also appointed a school nurse.

It is the opinion of leading educationists that systematic and efficient medical inspection would be of lasting benefit to the pupils, and that at present instances of seriously defective eyesight and hearing, and deformities in young children which are apparently receiving no attention, are common.

Manitoba.—In this district an Act to amend the Public Schools Act was passed in March, 1909. Section 127 of the said Act contains the following sub-section: " To establish and administer, by and with the consent of the Department of Education, a system of medical inspection of schools, and, subject to the provisions of ' The Public Health Act ' and the Regulations of the Board of Health

of the Province of Manitoba, to make such arrangements as may be sanctioned by the Department of Education for attending to the health, cleanliness, and physical condition of the pupils attending the public schools, under the jurisdiction of the Board of School Trustees of said district."

Winnipeg was the first place in Manitoba to avail itself of this legislation.

Saskatchewan.—The Education Department of the Province of Saskatchewan provides fully for the careful supervision by the teacher of all the schools and outhouses, as to heating, ventilation, and cleanliness. Teachers are also required to exercise great care as to infectious diseases.

In the draft of proposed changes in the course of study for public schools attention is given to personal, household, municipal, and national hygiene, but there is not yet any systematic medical inspection of schools in Saskatchewan.

Alberta.—In this new province the question of medical examination of schools and school children has not as yet become a live issue. In the case of two or three of the largest schools the matter is now receiving consideration, and the Department of Education is gathering such information as can be obtained relative to this phase of its work, which must soon be taken into serious consideration.

The School Board of Pincher Creek, Alberta, seems to have been the first in Canada to establish a system of medical inspection of schools, inaugurated December, 1905, and the Board has publicly announced that they give their unqualified endorsement to this system, not only from a hygienic but also from a financial standpoint. They also state that from 1900 to 1905 the school had to close every year for some outbreak of disease, but that this has never happened since 1905.

British Columbia.—Vancouver schools have had medical inspection since 1907. The School Board recently requested the Vancouver Medical Association to report on the requirements of medical inspection, and the Association appointed a committee, which reported in favour of the appointment of a specially qualified physician who should

report monthly to the superintendent; examine every pupil each year and keep records, both physical and mental, of each pupil; inspect and report upon all school buildings; give lectures to teachers and pupils and others on the subjects of hygiene and first aid to the injured; report to the superintendent at least once a month or oftener on all infectious and contagious diseases.

It is felt by those well qualified to judge that on account of the great influx of new settlers from everywhere the need of preventive medical oversight will in all probability be found more urgent than in the older provinces of Canada. School sanitary and health matters generally are, of course, reported on regularly by the school inspectors, and are further under the control of the Provincial Board of Health, which has now under consideration the preparation of regulations with respect to the medical inspection of schools and kindred matters.

In the year 1907 legislation was passed in Alberta providing the basis of medical inspection of schools.

REFERENCES

The Reports of the Education Authorities of the various Provinces of Canada should be consulted.

The following contain articles dealing with medical inspection of schools and scholars:—

The Canadian Educational Monthly, vol. viii. and vol. ix. Edited by A. MacMurchy. Toronto.

"Proceedings of the Ontario Educational Association," vol. xlvii. 1908.

"Proceedings of the Ontario Educational Association," vol. xlix. 1910.

"Proceedings of the Academy of Medicine." 1909.

XXIII

MEDICAL EXAMINATION OF SCHOOLS AND SCHOLARS IN AUSTRALIA[1]

BY

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THE Australian Commonwealth possesses an area of nearly three millions of square miles and a school population of less than three-quarters of a million children. Its social conditions differ somewhat from those of older countries, and its national wealth is considerably more widely distributed. For these reasons, problems arising from crowded populations, sordid poverty, and consequent neglect of physical conditions, such as confront school administrators in Great Britain and on the Continent, are not so pressing in Australia. Nevertheless, it is true of Australian as of other schools that they contain a number of children suffering from preventable and remediable physical defects. The causes that make medical inspection necessary may vary perhaps in degree, but they are found operating here as elsewhere.

STATISTICAL CONSIDERATIONS.

The following table gives the latest available figures regarding the number of State and non-State schools, teachers, and pupils in the Commonwealth:—

[1] The information contained in this chapter has been kindly furnished by the Department of Public Instruction, New South Wales.

State Schools, 1908.

State.	Schools.	Teachers.	Enrolment.	Average Attendance.
New South Wales ...	3,002	5,728	216,627	155,913
Victoria	2,010	4,665	174,713	143,551
Queensland ...	1,104	2,415	87,229	67,309
South Australia ...	690	1,322	54,157	38,193
West Australia ...	414	950	30,176	25,141
Tasmania	362	632	27,760	15,951
Commonwealth ...	7,582	15,712	590,662	446,058

Non-State Schools, 1908.

New South Wales ...	792	3,501	57,111	48,203
Victoria	696	2,188	54,036	43,000
Queensland ...	167	750	15,199	12,898
South Australia ...	196	697	10,888	9,168
West Australia ...	118	413	8,081	6,561
Tasmania	156	468	7,084	5,700
Commonwealth ...	2,125	8,017	152,399	125,530
All Schools in Commonwealth ...	9,707	23,729	743,061	571,588

Arrangements for Medical Examination of Schools and Scholars.

The first State in Australia to provide for the medical inspection of schools in a systematic way was Tasmania, where, under the personal direction of Dr. J. S. C. Elkington, Chief Health Officer, and Dr. A. H. Clarke, Medical Officer to Government Departments, several schools were inspected, and a series of anthropometric observations made before the end of 1906. A few months later, in May, 1907, arrangements were made in New South Wales for the medical inspection of State schools in two populous centres—Sydney and Newcastle. The inspection work in Sydney was entrusted to Dr. R. E. Roth, and in Newcastle to Dr. May Harris. Subsequently, an

additional inspector, Dr. Grace F. Boelke, was appointed to assist Dr. Roth in the metropolitan area.

In two other States—Victoria and South Australia—medical inspection is just at present at an incipient stage. In Victoria, three officers have been appointed, but have not yet (October, 1909) commenced duty. In South Australia a doctor is at present engaged upon the examination of a thousand children from various parts of the State. Upon the receipt of his report, the government propose to consider the question of introducing systematic medical inspection. In Queensland and West Australia no systematic scheme has yet been initiated. In the former State, however, the advice of the medical officers of the Health Department is available in matters of school hygiene, and these officers occasionally visit schools and advise in regard to sanitation. In West Australia one medical officer is available to visit schools where necessary. New South Wales is practically the only State in the Commonwealth which has taken up the work of medical inspection in a comprehensive manner. Even here, the plan of work is capable of considerable extension. An examination of all children, and not merely those specially selected, might be undertaken. Again, the examination of each child on its first admission to the school serves a very useful purpose. Extension, however, in these directions is not at present proposed, since it is considered more desirable that the present mode of inspection should be spread over the largest possible area than that a more minute inspection should be confined to a limited field.

Methods of Inspection in New South Wales.

In a certain number of schools physical tests are made annually, the first procedure being to take the height (without shoes) and weight of the pupils, and to test the acuity of their vision. This work is done by the teachers, who are supplied with a standard weighing and measuring machine, sight-testing cards (Snellen type), and all necessary instructions. The teachers are requested at the same

time to make a list of such children as appear to be physically or mentally defective, or who exhibit signs of such ailments or defects as open-mouthed breathing, continuous discharge from the nose, discharge from the ears, skin affections, sore throat, stooping shoulders, stiffness and pain in joints, lumps in the neck, lameness, or parasites on the head. After affording parents the option of declining examination for their children, the teacher presents, for inspection by the doctor, pupils with sight below normal, and all others who appear to be suffering from any of the defects mentioned. These the doctor examines, together with others whom, from his own general observation, he may think it advisable to inspect. The treatment of ailments is not included in the medical officer's work. It is his duty simply to determine whether a pupil is suffering from any complaint which requires attention, and to inform the parent to that effect on a form, of which the following is a copy :—

DEPARTMENT OF PUBLIC INSTRUCTION, NEW SOUTH WALES.

(School) .....

(Pupil).....

is suffering from .....

and should be seen by the family doctor.

.....

Medical Inspector.

So far, the medical inspection has embraced 105 schools, containing 70,169 pupils, while upwards of 50,000 anthropometric records have been received from teachers.

Apart from the pupils, medical inspection extends to all candidates for entrance to the teaching service, or to the training college, and all probationary students (young people undergoing a course of study preparatory to entering the training college).

In addition to the inspection of children, the medical

inspectors also report upon the hygienic condition of school premises, with special reference to lighting, ventilation, and drainage.

For some time past the Dental Association of New South Wales has co-operated with the educational authorities in taking records of the condition of the mouths and teeth of the children in various parts of the State. Some 5,000 dental records have already been received.

Medical Examination in Tasmania.

The general examination of school children in Hobart was based upon that of the Royal Commission on Physical Training (Scotland) of 1903, with modifications to fit it to local requirements. A comparatively small number of children (over 1,200) was inspected, but in each case a form containing some fifty-one separate questions was filled in, fourteen of these being answered by the class teacher, six by the special officer (a specially qualified teacher who took measurements, tested vision and hearing, and generally instructed other teachers in this particular work), and thirty-one by the medical examiner. These questions were grouped under fourteen general headings: (1) parentage, birthday, etc.; (2) school standard; (3) attendance and conduct; (4) measurements : height, weight, and girth of chest; (5) acuteness of vision and hearing; (6) personal appearance; (7) cleanliness; (8) mouth and teeth; (9) throat and nose; (10) ears; (11) eyes; (12) diseases; (13) deformities; (14) other observations.

The following indicate some of the more important results:—

Eye Defects.—Of the whole number (1,259) of children submitted to the card test, 55.8 per cent. had good vision (reading $\frac{6}{6}$ or $\frac{6}{5}$) 36.4 had fair vision (reading $\frac{6}{10}$), and 7.8 per cent. had bad vision (reading $\frac{6}{15}$ or worse). For both sexes, the age-groups in which most "bad" eyes were found was that with 11 as the nearest birthday.

Ear Defects.—Of 1,272 children examined, 155 (12.17 per cent.) had defective hearing or disease of the ear.

Adenoid Growths.—Over 38 per cent. of all children

examined were provisionally returned as suffering from post-nasal trouble. In regard to these adenoid growths Dr. J. S. C. Elkington, late Chief Health Officer of Tasmania, states:—

> If a liberal allowance (one-third) be made for possible error, the number of children with post-nasal disease was over 25 per cent. of all examined. But if 90 per cent. of those children with much enlarged tonsils (a generally accepted proof of the existence of post-nasal growths) be added, the percentage rises to 33 per cent. Had a system of medical inspection no further result than to induce the parents of 20 per cent. of the children suffering from this mental and physical handicap (adenoids) to submit them to operation, it would amply justify its existence from an economical point of view.

Results of Medical Inspection in South Australia.

Dr. H. S. Rogers, who examined a small number of school children at Adelaide, found that from 60 to 70 per cent. of the scholars suffered from adenoid growths or enlarged tonsils. Grave defects in eyesight were not numerous, and curvature of the spine, so prevalent in some other countries, was scarcely seen. On the question of dealing with feeble-minded children he recommended the appointment of a small board of commissioners who should supersede the official visitors at the asylum, and whose powers could be extended to include that branch of work.

Results of Medical Inspection in New South Wales.

The results of the first year's work, which ended Easter, 1908, showed that of an enrolment of 30,000 pupils in thirty-eight Sydney schools, about 10 per cent. were suffering from various ailments, principally defective sight and trouble of the throat and post-nasal passages. In the Newcastle district (a large industrial area) the percentage was greater, especially as regards slightly defective vision. Returns obtained from teachers indicated that the advice given by the inspectors was followed by the parents in rather less than 25 per cent. of the cases. To bring about improvement in this direction, the medical examination of the children at school has been followed up

by the organising of parents' meetings, at which the medical officers have given plain health talks, with special reference to the children's ailments, and pressed home upon the parents the necessity for attention to the ailments that the medical examination had revealed. These meetings have been held as a rule in one of the school classrooms; they have been well attended, and have had a most beneficial effect. As a result the proportion of children since treated has considerably increased.

The results of the second year's work, which have just been tabulated, show that during this period the medical inspectors visited 98 schools, with a total enrolment of 66,000 pupils, 14,360 of whom were presented for inspection as suffering from some physical defect. Of these pupils, 8,216, or 57 per cent. were found to be suffering from defects of vision. No fewer than 7,171 children (49 per cent.) were returned as suffering from post-nasal trouble, 3,450 (24 per cent.) from throat trouble, 855 (6 per cent.) from swollen glands, and 615 (4 per cent.) from either defective hearing or ear trouble.

So far as the anthropometric survey is concerned, it clearly showed that the children attending schools in well-to-do districts are distinctly taller and heavier than in the industrial centres, and that the latter children are of better physique than those of the poorest area. The superiority of the child of well-to-do parents was shown not so much at the earlier age-groups as at the higher ages. Among the children from industrial suburbs, and from the poorer city and suburban areas, the decline in physique from about the 11th year onward was found to be very noticeable. One of the most interesting comparisons made was that showing the remarkable relationship between the physical growth of the children and their mental development. As regards vision, defective eyesight was found to be most prevalent at the early ages. As children grow older their sight improves, and there are consequently far more children with defective vision in the junior than in the senior classes. It is hardly a matter for surprise that the sight of city children should be found more defective than

that of country children; but it is rather singular that in town and country alike, the sight of girls should be shown to be worse than that of boys. Respecting dental conditions, the percentage of children with defective teeth in Sydney (94 per cent.) is about the same as in Germany, Russia, Italy, and America. A comparison of the teeth of Sydney children with those of London, Edinburgh, and Aberdeen showed that the former are the cleaner. The average number of decayed teeth in Sydney children (4.4 per boy and 5.2 per girl) is, however, greater than in those of England and Scotland.

Referring to buildings, the schoolrooms in existence, most of which were erected many years ago, are being gradually remodelled as regards furniture, lighting, and ventilation. In the remodelled rooms, furniture is arranged so that the light falls on the pupils' left, much to their advantage and to the teacher's comfort. By means of movable glazed partitions, many schools are now so divided that there is a classroom for each class, and where necessary, by sliding back the partitions, two classes can be combined. In the construction of new buildings, care is taken to meet modern hygienic demands, but the remodelling of old premises can be only a matter of years.

REFERENCES.

The following official Reports will be of service for reference:—

"Report on the Hygienic Condition of Tasmanian State Schools, 1904."

"Report on the Medical Examination of State School Children, Tasmania, 1906."

Reports for 1908 and 1909 on "The Physical Condition of New South Wales Children."

Report on pp. 217-232 of "Dependent Children." Inter-State Congress of Workers, Adelaide, May, 1909. Adelaide: 1909. (To be obtained from Agent-General for South Australia, 85, Gracechurch Street, E.C.) 6d.

Departments.

See also Annual Reports of the various Educational

XXIV

MEDICAL EXAMINATION OF SCHOOLS AND SCHOLARS IN NEW ZEALAND

BY

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FOREMOST in much that makes for the physical weal of its people, New Zealand has made but little organised endeavour in the direction of medical inspection of children attending the State Schools. A scheme was prepared in 1904 under instructions from the Hon. Mr. McGowan whereby a systematic inspection of the State school scholars was to be made. This scheme received the approval of the medical and educational authorities, but the Government was unable to see its way to apportion the money necessary. The matter has been under consideration at various times, but so far nothing has been done in the direction of dealing with this important aspect of public health. There are at present something like 129,000 children attending the State schools, and it has been estimated that about 10 per cent. would probably require detailed examination. In a sparsely populated country like New Zealand, with an area equal almost to that of Great Britain and a population of little over one million, it is evident that any scheme such as is now being carried out in England is out of the question. Except in the cities, the schools are far apart, and to attempt more than a yearly inspection would entail an expenditure which would be difficult to justify.

Proposed Schemes for Medical Examination.

The proposal was to appoint an examiner for each province, to be paid partly by the central Government and partly by the education boards controlling the schools in the several districts. The teachers were invited to help in the work, and with few exceptions they signified their willingness. The idea was that the teacher should prepare a list of those scholars whom he considered below par in health, that this list should be submitted to the medical inspector, and that detailed examination should be confined to these selected cases. Only in this way would it have been feasible to carry out any general scheme of medical inspection. In anticipation of the Government's approval of the scheme the health officers delivered lectures to the teachers, and Dr. Ogston[1] drew up an excellent booklet for their guidance. In some of the larger cities private practitioners made detailed examinations of certain schools and elicited the fact that there was a large number of children attending the schools who suffered from enlarged tonsils, adenoids, carious teeth, and enlarged glands.

It is impossible, however, to speak with definiteness as to any of these conditions, for the examinations were few and not concerted.

The Dental Association of New Zealand made several praiseworthy efforts to inspect the teeth of the children attending some of the schools in the larger cities, but the absence of any monetary support from either the Government or the education boards made these experiments of only temporary value.

As a matter of fact the only regular examinations that are made are of those scholars attending such colleges as Wanganin and Wellington, and the Girls' High School in Dunedin.[2]

The data supplied by Miss Marchant, principal of the

[1] Ogston, Frank, M.D., District Health Officer for Otago: "Hints to Teachers on Medical Inspection."

[2] Mason, J. M., M.D., Chief Health Officer for New Zealand: "Proposed Scheme for Medical Inspection of Schools," Public Health Reports, 1905-1908.

Girls' High School at Dunedin, though small, offers some interesting points. If the girls attending the Dunedin school are compared with those attending the North London Collegiate School for Girls, it will be seen that the New Zealanders, age for age after 14, are taller, heavier, and have a greater chest measurement.

TABLE INDICATING PHYSICAL CHARACTER OF GIRLS ATTENDING THE OTAGO HIGH SCHOOL FOR GIRLS, 1906-1908.

Number of observations.	Age.	Height, average.	Weight, average.	Chest girth, average.
		inches.	lbs.	inches.
31	12	57.4	82.2	27.2
220	13	59.7	90.7	29.4
498	14	62.0	101.7	30.0
306	15	63.8	115.0	26.4
151	16	63.7	117.0	32.2
99	17	65.6	125.3	33.0
29	18	64.6	132.0	33.6

NORTH LONDON COLLEGIATE SCHOOL FOR GIRLS, MAY, 1893-MAY, 1902.

Number of observations.	Age.	Height, average.	Weight. average.	Chest girth, average.
		inches.	lbs.	inches.
88	12	57.91	84.14	27.17
110	13	59.82	91.69	27.91
129	14	61.66	105.48	29.14
151	15	62.42	112.43	29.87
131	16	62.44	114.54	29.57
42	17	62.46	120.66	29.30
8	18	62.15	121.00	30.07

It will be seen also that in height and weight the New Zealand girl is considerably above the standard laid down by the Anthropometric Society.

Apart altogether from the benefits which would accrue from a medical inspection of school children with respect to their health and physical condition, such observations would be of value in assessing the influence of the better economic and climatic conditions which obtain in such new countries as New Zealand and Australia. It is greatly to be regretted that the authorities have not seen fit to undertake this important and valuable work.

Such a system of inspection, where the sorting out of the abnormal cases would be largely dependent upon the teacher, would probably not be as satisfactory as if the medical inspector could pass *all* the scholars through his hands, and it was suggested wholly in order to keep down the cost.

The child who complains that he cannot see the figures on the blackboard, the scholar who always turns one ear to the teacher, who sits with his mouth open, who complains of frequent headaches, suffers from constant toothache, who coughs, suffers from a rash, or who mopes or limps about the playground, would be placed upon the list which would be submitted to the medical inspector. Thus instead of having to examine the whole school he would be able to concentrate his attention on some 10 or 12 per cent. of the scholars. If these inspectors were whole-time officers employed by the Government and the education boards, much of the friction and some of the difficulties of administration would be removed. The inspector would confine himself solely to reporting, and the treatment could be left to the practising medical men, or where the parents were poor, the help of the hospitals could be invoked.

After all, the inspection of the children should only be a means towards an end, and that end should be the treatment, and, if possible, the curation of the children. Most of the school inspectors are men greatly interested in their work, and many valuable reports are sent in by them on the sanitary conditions of the schools. Very often the

amount of money at the disposal of the education boards is inadequate for the purpose, and considerable discontent obtains in many districts. New Zealand is markedly behind her conservative, slow-moving Mother in this respect, and it would gladden the hearts of all those interested in the best interests of the young Britons growing up in that beautiful island if some more concern was evidenced by those in authority in this department of public health.

REFERENCES

FERGUSON, LINDO: "The Eyes of the School Child." 1900.

MASON, J. MALCOLM: "Medical Inspection of Schools." Public Health Reports, 1905-1909.

OGSTON, F.: "Hints to School Teachers on Medical Inspection." 1906.

THOMPSON: "The Teeth of School Children." 1904.

XXV

MEDICAL EXAMINATION OF SCHOOLS AND SCHOLARS IN THE UNITED STATES OF AMERICA

BY

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THE first real system of medical inspection in the United States seems to have been begun in Boston, Massachusetts, in 1894, when the Board of Health selected fifty physicians as medical inspectors, divided the city into fifty school districts, and began work. New York City followed in 1897, when 134 salaried medical inspectors were appointed for the public schools. Chicago started medical inspection in 1895 and Philadelphia in 1898.

THE EVOLUTION OF MEDICAL EXAMINATION OF SCHOOL CHILDREN IN AMERICA.

The movement had its inception in America in the great cities and was at first in every case a mere inspection for the

detection of contagious diseases among school pupils. From the greater cities medical examination rapidly spread to the smaller ones. In most cases the first step was taken by a local medical society offering to carry on voluntary work in the schools for a limited time to demonstrate the desirability of the work. This was in almost every case followed by the establishment of a regularly organised system of work under the auspices of either the municipal Board of Health or the Board of Education. From the modest beginnings in four great cities in the past decade the medical inspection movement has spread over America, first slowly, and in the past three years very rapidly, until the work is now carried on in practically all of the great cities and most of the smaller ones. Nine State laws providing for medical examination have been passed, varying greatly in character, some of them being merely permissive, others mandatory.

Present Scope of Medical Examinations.

At the close of the year 1909 reliable data are available giving the status of medical inspection in cities, including one-half of the urban population of America. These cities from which reliable data have been secured number 360. They are located in forty-two States and the District of Columbia. Their total population is some twenty-two million, and there are enrolled in their schools over four million school children. There seems to be good evidence to indicate that conditions in these cities are representative of conditions in American cities as a whole.

Among these 360 cities, 107, or something less than one-third of them, have no medical inspection of any sort in their schools. Practically all of the cities having any sort of medical inspection conduct examinations for the detection and exclusion of contagious diseases. In nearly all of the cases, too, examinations are made to discover cases of defective vision and hearing. In about two-thirds of the cities having any sort of medical inspection, physical examinations are conducted to discover such sorts of defectiveness as adenoid growths, hypertrophied tonsils,

enlarged glands, cardiac weaknesses, etc. In one-quarter of the cities school nurses are employed. In forty-eight cities the school nurses work also in the homes of the parents. In 101 cities cards of instruction about tuberculosis, dental hygiene, and diet are distributed among the parents, while 157 cities have arranged to co-operate with dispensaries, hospitals, and relief societies for giving needy children shoes, clothing, or dental and medical care when it is found necessary.

The work of medical inspection now carried on in American schools may properly be divided into three classes. *First* consists of examinations conducted for the detection of contagious diseases. *Second* consists of examinations conducted by the teachers themselves to detect the presence of defective vision and hearing. *Third* comprises examination for the detection of contagious diseases as well as complete individual physical inspection in order to detect not only defects of vision and hearing but other physical disabilities and organic diseases.

Vision and Hearing Tests applied by Teachers.

The policy of legislators and school administrators in arranging to have tests for sight and hearing conducted by school teachers themselves rather than by specialists has occasioned many expressions of surprise and no little criticism. This policy, however, has reached its present wide development on the recommendations of specialists themselves who deem that such tests are wholly within the capacity of the teacher. It is their opinion that children are subjected to less nervous strain when tested by their teachers than when tested by strangers, and therefore exhibit themselves in a more natural way. It is always the intention, however, wherever this policy is followed, to have scientific examinations made by specialists in cases where defects are apparently revealed by the teachers' tests. For this purpose there are furnished blanks on which the teacher notifies the parents of apparent defects and advises consulting a specialist.

Work of this sort has greatly increased since the action

of the State Legislature of Massachusetts in 1906 in passing a medical inspection law containing mandatory provisions by which vision and hearing tests are conducted by the teachers. During the hearings while the Medical Inspection Bill was being considered a mass of evidence was presented by experts bearing upon the question of the feasibility of such tests. The high standing of the three gentlemen who subscribed to the following opinion at the time of the hearings referred to make it particularly significant:—

> It is the opinion of the undersigned, based upon professional experience, that school teachers, with the aid of printed directions properly prepared, are, because of their acquaintance with the individual children under their charge and their subsequent ability to communicate with them and to find out what is in their minds, more capable of making a satisfactory examination of the hearing of such children than a doctor other than a specialist called in for the purpose would be likely to be.
>
> (Signed) Clarence John Blake, M.D.
> D. Harold Walker, M.D.
> William F. Knowles, M.D.

There can be no doubt that the conduct of these tests awakens teachers to a quickened interest in the bearing of physical defects on school progress because they get a closer insight into the characteristics of their pupils which stimulates them to do further work in the field of child study. Where no form of medical inspection exists such tests by the teachers certainly constitute a useful and practical first step towards securing such a system. It is certain, however, that work done by the teachers does not and cannot render unnecessary the services of the trained medical expert.

Medical Examination for the Detection of Contagious Diseases.

Where there is any sort of medical inspection it is nearly invariably true that inspection for the detection of contagious diseases is included as one of the most important

items. Indeed, there are many cities where this is the only work carried on. Its object is primarily the protection of the community, and because of this the work is very often conducted by physicians of the Board of Health. In most cities of the United States the inspectors call daily at the schools assigned to them and examine such pupils as are referred to them by the teachers and principals. These pupils include all who have returned to school after being absent on account of illness or from unknown causes, as well as those who are in school and suspected of suffering from some infectious or contagious ailment. In most cities examinations are made for the following diseases: Scarlet fever, diphtheria, measles, small-pox, chicken-pox, tonsilitis, pediculosis, ringworm, impetigo contagiosa, trachoma, and other transmissible diseases of the skin, scalp, and eye. Tuberculosis, when thought to be far enough advanced to be a menace to public health, is generally reported to the chief medical inspector before excluding the pupil from school.

In general the procedure with respect to the more common contagious diseases is substantially as follows:—

Scarlet fever cases are not allowed to return to school until all desquamation is completed and there is an entire absence of discharge from the ears, nose, throat, or suppurating glands, and the child and premises are disinfected. *Diphtheria* cases are excluded until two throat cultures made on two consecutive days show absence of the Klebs-Loeffler bacilli. Those exposed to diphtheria are excluded one week from the last exposure. *Measles* cases are excluded for three weeks and longer if there is present bronchitis, inflammation of the throat or nose, or abscess of the ear. Those exposed to measles are excluded two weeks from the date of the last exposure. *Whooping-cough* cases are excluded until after spasmodic stage of the cough—usually about eight weeks. Those exposed to whooping-cough are excluded two weeks after the date of the last exposure. *Mumps* are excluded for ten days after all swelling has subsided. *Chicken-pox* cases are excluded until the scabs are all off and the skin smooth. *Cases of*

tonsilitis are excluded on clinical evidence alone and throat cultures are made for future diagnosis. In making throat examinations wooden tongue depressors are used to the exclusion of all other tongue depressors. Each tongue depressor is used only once and then burned. Aseptic methods are employed in all examinations.

When children are excluded, brief but sufficient reason therefor is written on an exclusion card, which is sent to the parents. One copy is filed with the school authorities, and one with the Board of Health. School physicians are forbidden to make any suggestions as to treatment and management of the pupils who are sick. This rule is nearly universal, and is made imperative.

Children recovering from measles, whooping-cough, mumps, chicken-pox, scarlet fever, diphtheria, and small-pox are not allowed to re-enter the school without a permit from the Department of Health. If they have been taken sick with any of these infectious diseases in the school-room, the pupils of the room are dismissed and the room disinfected.

Methods of Physical Examinations.

Municipal and educational authorities in America have very generally realised that the theory on which physical examinations are conducted rests on a different foundation from that underlying medical inspection for contagious diseases. The latter is primarily a protective measure and looks mainly to the present safeguarding of the community. The former aims at securing physical soundness and strength and looks far into the future.

It has been brought into being by successive results of a long series of studies which have shown that there are many physical defects which are common among children and have an important bearing on their present health and future development which may be easily remedied or modified if they are discovered early enough.

The following is a copy of the record card which is in use in New York City to record the results of the individual physical examinations of pupils. By referring

DEPARTMENT OF HEALTH, CITY OF NEW YORK.

Physical Record of.....Sex.....Born.....

Nationality of Father.....Mother.....Number in Family, Adults.....Children.....

Number of Birth.....History of Measles.....Scarlet Fever.....Diphtheria.....Pertussis.....Pneumonia.....Grippe.....

Date of 1st Examination.....in School.....

	1		2		3		4		5		6		7		8		9	
1. School year																		
2. Term	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
3. Class																		
4. Revaccinations																		
5. Diseases during term ...																		
6. Date of physical examinations																		
7. Height																		
8. Weight																		
9. Nutrition																		
10. Anæmia																		
11. Enlarged glands																		
12. Nervous diseases																		
13. Cardiac disease																		
14. Pulmonary disease																		
15. Skin disease																		
16. Defect orthopædic																		
17. Defect of vision																		
18. Defect of hearing																		
19. Defect of nasal breathing ...																		
20. Defect of palate																		
21. Defect of teeth																		
22. Hypertrophied tonsils ...																		
23. Adenoids																		
24. Mentality																		
25. Conduct																		
26. Effort																		
27. Proficiency																		
28. Treatment necessary ...																		

INDIVIDUAL RECORD CARD, NEW YORK CITY.

to the headings under which the entries are made we may see what the defects are which the school physicians search for and record if discovered. The list for New York City is not very different from the list commonly employed in other parts of the country. It may be regarded as typical.

The Results of Medical Examination.

The most extensive results yet secured in the United States as to the physical conditions of school children are those from the examinations conducted by the Board of Health in New York City. The results for the year 1908, as published in the Report of the City Superintendent of Schools for that year, are as follows:—

	Total.	Percentage.
Number of children examined ...	210,585	100
Found to have no defects ...	52,840	25
Found to have physical defects	157,745	75
Found to be suffering from—		
Mal-nutrition	5,923	2.8
Anæmia	7,608	3.6
Enlarged glands	53,828	25.5
Nervous diseases	1,337	.6
Cardiac diseases	1,445	.6
Pulmonary diseases	1,077	.5
Skin diseases	2,918	1.4
Orthopædic defects	1,418	.6
Defect of vision	28,336	13.4
Defect of hearing	2,355	1.1
Defect of nasal breathing ...	20,688	9.8
Defect of palate	2,769	1.3
Defect of teeth	93,938	44.6
Hypertrophied tonsils ...	54,183	25.7
Adenoids	36,514	17.3
Defective mentality	1,303	.6

The Rôle of the School Nurse.

The school nurse is now considered to be one of the

most necessary adjuncts of the better forms of our American systems of medical inspection. It may be said, indeed, that there is no division of opinion on this subject.

The first regular employment of trained nurses in connection with the work of medical examination was begun in New York City in December, 1902, when a corps of nurses was established each at a salary of seventy-five dollars per month. Since that time experience has proved, especially in the largest cities, that the employment of competent school nurses is almost a necessity.

The nurses are especially valuable in reducing the number of exclusions of children from school on account of minor illnesses. Many of these when properly treated by the nurse in school do not prevent the regular attendance of the child being interfered with. The trained nurse greatly enhances the success of the work of the school physician in improving the health of the school children. She aids the school teacher in detecting the first signs of approaching illness. She sees to it that all excluded cases are placed under treatment as soon as may be, so that there is the least possible loss of time from school and interference with education. She treats those cases which would for various reasons receive no attention at their homes. She assists the school physician in the clerical work of recording the results of the physical examinations which he conducts.

In many cases it is also found feasible to employ the nurses during the summer months when there is no school in work directed to the lessening of the great mortality rate among infants from summer diarrhœa, due mainly to improper care and feeding. Again, she aids materially in the anti-tuberculosis campaign. About a quarter of the cities having any sort of medical inspection employ school nurses, and the number is increasing rapidly. To sum up the case for the school nurse: she is the instructor of parents, pupils, teachers, and all members of the family in the principles and practices of hygiene. She is a most efficient link between the school and the home.

Organisation and Administration of Medical Examination.

Professor William Osler is credited with saying in regard to the work of medical inspection in England: "If we are to have school inspection, let us have good men to do the work and let us pay them well. It will demand a special training and a careful technique." It is certainly to be regretted that this point of view has not been more generally taken in America. In this country the financial remuneration of school physicians is almost invariably inadequate. Salaries range from $200 a year to $2,400 a year.[1] The first amount is, of course, paid in return for only part of the school doctor's time. Nevertheless, the sum of $200 per annum has come to be regarded as a somewhat standard rate of remuneration for school physicians all over America. There are, of course, cases where so little work is required that this amount may be considered adequate, but undoubtedly in most cases it represents an undue degree of sacrifice on the part of the school physician. New York City pays its medical inspectors $100 per month each for twelve months in the year. The work given by them in return for this wage does not require their entire time. The same city pays its nurses $75 per month and employs them twelve months in the year. The maximum nurse's salary in Boston is $1,116 per annum for supervising nurses, and $840 per annum for assistant nurses. Many of the smaller cities pay their nurses $600 per year.

The *per capita* cost of medical inspection for salaries alone ranges from about one-half of one cent for vision and hearing examinations conducted by teachers to about $1.25 for complete physical examinations in a few localities. These extremes, however, do not at all represent average conditions. In general the *per capita* cost of medical inspection in America ranges from ten to fifty cents per annum. It seems to be a fair generalisation to say that medical inspection for the detection of contagious diseases

[1] This, according to English standards, is about £40 to £480.

can be adequately performed at an annual cost of about fifteen cents *per capita*, while physical examinations similarly performed and including the inspection for the detection of communicable disease cost about fifty cents.

According to the best American practice there should be one medical inspector and one nurse for each two thousand pupils in cities where the nurse and physician are employed on full time and the schools are so large and close together as to reduce to a minimum the time spent in going from one building to another. These figures would have to be radically altered for rural districts.

Physical examinations for the detection of non-contagious physical defects can be made by an experienced school physician in about twelve to fifteen minutes per child. Vision and hearing tests alone demand from three to five minutes per child. Systems of medical inspection which include careful physical examinations of all children cost the most and are by far the most valuable. From a social and economic point of view they are by far the cheapest in the better sense of the word, as they are the most far-reaching, both in their immediate and indirect results. Permanent efficiency requires skilled workers, careful administration and adequate remuneration.

State Laws for Medical Examination of Schools and Scholars.

At the present time nine states of the Union have laws dealing with the medical examination of schools. The most important legislative enactment is, without doubt, the Massachusetts law which was passed in 1906. It provides that each school child shall be given a complete physical examination by a school physician each year. Physicians are employed to examine regularly the children who are suspected of being the subjects of contagious disease; and children who have returned to school after unexplained absence. All children are also examined each year by the school teachers for defects of vision and hearing. The Massachusetts law is mandatory in its pro-

visions. It has been very successful during the three years that it has been in operation. Provision is made for conducting the work under either the auspices of the local Board of Health or the local Board of Education, but the present tendency seems to be strongly in the direction of giving the work into the hands of the Board of Education.

The Maine law, passed in 1909, closely resembles that of Massachusetts, with the exception that it is mandatory only in the case of cities and towns having a population of less than 30,000 inhabitants.

Connecticut, Vermont, and Colorado have laws requiring the periodical testing of the eyesight and hearing of all scholars in public schools. The tests are conducted by the teachers. The Connecticut law was passed in 1899, and the tests are conducted tri-annually. The Vermont law was enacted in 1894, and the tests are made annually. The Colorado law was passed in 1909, and provides for annual tests.

The law of the State of New Jersey was passed in 1909, and is mandatory. It supersedes an earlier Act passed in 1903, which was permissive in its provisions. The present law provides that towns and cities shall employ medical inspectors whose duty it is to make an annual physical examination of every scholar. They are also charged with the duty of lecturing to the teachers concerning the methods employed to detect the first signs of communicable diseases and the recognised measures for the promotion of health.

The California law is more unusual in its provisions. It provides for examinations which may be conducted by medical or non-medical men who have received special training in the physical and mental testing of children. The enactment makes special provision for mental as well as physical tests. It was passed during the year 1909, and is permissive.

Another permissive law enacted during 1909 is that of the State of Washington. This empowers school directors in districts of the first class to appoint school medical examiners. These examiners decide for the Board of

Directors all questions relating to the sanitation of schools and health matters affecting the safety and well-being of the scholars of the district. They are required to make monthly examinations of each school in the district and report as to the condition of the same to the Board of Education and Board of Health.

Indiana simply provides for a system of medical inspection in Indianapolis, a city of nearly 200,000 population. It is remarkable in that it provides that this city shall set aside "one-half per cent. per hundred of the taxables of the city, irrespective of what the tax levy of city may be, for the inspection of school children in private, public, parochial, and kindergarten schools." It also provides for nurses in conjunction with this work.

In a number of States laws relating to the medical examination of schools and scholars are now pending, and there can be no doubt that many, if not all, will be passed.

Open-air Schools.

The movement to provide open-air schools is spreading very rapidly throughout the United States. The first school was started in the city of Providence, Rhode Island, in January, 1908. It is the most conspicuous example of this sort of work in America.[1] The Providence school is designed primarily to benefit children who are classed as "pre-tuberculous"—that is, children whose physical condition is such that they are apparently either in the first stages of tuberculosis, or in such a physical condition that predisposes them to fall easy prey to the disease.

The school is held in an ordinary school building in rooms with southern exposures, which have been altered so as to leave the southern sides of the rooms almost entirely open. The children are given careful medical attention and plenty of food. Although little emphasis is placed on the ordinary school studies, it is found that

[1] See article by Miss Isabel F. Hyams and Dr. James J. Minot, "The Out-Door School for Tuberculous Children, Boston, U.S.A.," in "Open-Air Schools," Special Number of *British Journal of Tuberculosis*, July, 1909. London: Baillière, Tindall and Cox. 5s. annually.

the children make good progress in the short time devoted to them.

Other open-air schools are now at work in the cities of Boston, Brookline, Charlestown, and Malden in Massachusetts; in New York City and Rochester in New York; in Hartford, Connecticut; Pittsburg, Pennsylvania; Columbus, Ohio, and Asheville, North Carolina. The schools are of three types—(i) open-air schools in regular school buildings of the Providence type; (ii) outdoor schools conducted in tents and small buildings in parks and country places; and (iii) so-called cold-air schools. These latter are schools carried on in ordinary school buildings where no alterations have been made for the particular work in hand. In such cases the windows are kept fully open nearly all the time the scholars are in attendance except in the most inclement weather. All of this work is in an experimental stage. In general, it is carried on under the joint auspices of the Board of Education, Board of Health, and some local anti-tuberculosis society.

New York City maintains one open-air school on the roof of a building and two on abandoned ferry boats. The exceedingly rapid spread of this work during the past year makes it seem certain that it will reach a very considerable development in the near future.

Dental Inspection.

Increasing attention is being given to the inspection of children's teeth in American schools, and the work is being more and more commonly carried on as a branch of school inspection in a semi-independent way. In a number of the larger cities the local dentist associations have made special rates for school children, and are undertaking an active campaign of propaganda to impress on pupils and teachers the importance of dental hygiene. In a number of these campaigns leaflets giving information and advice have been given wide distribution. The following is a copy of the reading matter of one of these leaflets, which has the endorsement of the Medical Academy of Dental

Science, the Dental School of Tufts, and the Dental School of Harvard University:—

What are the teeth for?—Not merely for ornament. Their chief use is to prepare the food for the stomach—to grind the food and mix it with saliva. Food which is not thoroughly chewed causes indigestion and constipation.

How long should the teeth last?—To the end of life.

How do we lose them?—By decay and loosening.

What causes teeth to decay?—Bits of food and candy sticking to the teeth; also a poor physical condition.

Where does the food lodge?—All along the edge of the gums, between the teeth, and in the crevices of the grinding surfaces.

Can decay be prevented?—Yes, to a large extent.

How can decay be prevented?—By scrubbing the teeth thoroughly with a tooth-brush, tooth-powder and water; and by keeping up the general health.

How often should the teeth be cleaned?—At least twice a day—after breakfast and at bed-time. Better after each meal.

Should the gums be brushed?—Yes; moderate friction helps to keep them healthy.

How often should tooth-powder be used?—At least once a day at bed-time.

Twice a year at least a dentist should carefully examine the teeth.

A bad condition of the throat, the nose and the ears is made worse by decayed teeth. They add to the chances of catching infectious diseases. Well cared-for teeth and a clean mouth help to prevent tuberculosis.

Cleanliness is the best guard against disease.

Among the 360 cities from which records of the medical inspection work have been secured, 119, or almost one-third, are carrying on special dental work.

The Feeding of School Children.

The problem of supplying meals to underfed school children which has engaged educational and philanthropic thought in Europe for the past quarter of a century or more is now forcing itself upon the attention of school authorities in America. Interest in this movement is as yet mostly restricted to the large centres of population. The Superintendent of Schools of New York City in his latest annual report estimates the number of children suffering from the effects of insufficient or improper food at about 18,000, or 3 per cent. Experimental work directed to the alleviation of this condition is being carried on in at least two of the public schools of the city. An

attempt is being made to make the effort self-supporting, and parents who are able to pay for their children's meals do so at the rate of about three cents each meal.

In the city of Chicago the Superintendent of Compulsory Education estimated the number of underfed school children in the city at 15,000, or 6 per cent. This report was submitted in October, 1908. At the present time work is being carried on in that city through co-operation with the charitable organisations. Basement rooms in school buildings and other suitable places have been fitted up in some of the poorer districts and charity workers are furnishing free breakfasts and lunches to many hungry children. In the opinion of the attorney of the Board of Education of Chicago money appropriated for school purposes cannot be expended for food, however necessitous the case may be.

Some work is being carried on in the city of Philadelphia by the Starr Garden Association in co-operation with the school authorities. In this city funds have been supplied for conducting a series of studies during the year 1909 to determine not only the number of underfed school children but the physiological effects on them following a course of systematic feeding.

REFERENCES.

The following books will be found of service for reference by those desiring fuller details of the question as it presents itself and has been studied in the United States of America:—

ALLEN, WILLIAM H.: "Civics and Health." Chapters on Physical Welfare of School Children, Mouth-breathing, Eye Strain, Dental Sanitation, Departments of School Hygiene. New York City: Ginn and Co., 1909. $1.50.

BARRY, WILLIAM F.: "The Hygiene of the Schoolroom." New York City: Silver, Burdette and Co., 1909. $1.50.

DUTTON, SAMUEL T., AND SNEDDEN, DAVID: "The Administration of Public Education in the United States." New York City: The Macmillan Co., 1908. $1.75.

GULICK, LUTHER H., AND AYRES, LEONARD P.: "Medical Inspection of Schools." Russell Sage Foundation Publication. New York City: Charities Publication Committee, 1908. $1.

See also *Psychological Clinic*, vol. i., 1907-1908, and vol. ii., 1908-1909. Philadelphia, Pa.: Psychological Clinic Press, Woodland Avenue and 36th Street. $1.50.

The following articles and reprints will also be found of service:—

ALLEN, WILLIAM H.: "National Program for Departments of School Hygiene." *North American Review*, 188, 1. New York City: North American Review Publishing Co., Franklin Square, July, 1908. 35 cents.

AYRES, LEONARD P.: "The Effect of Physical Defects on School Progress." *Psychological Clinic*. Philadelphia, Pa.: Psychological Clinic Press, Woodland Avenue and 36th Street, May, 1909. 20 cents.

BUREAU OF MUNICIPAL RESEARCH: "A Bureau of Child Hygiene." New York City: Bureau of Municipal Research, 261, Broadway, September, 1908. 35 cents.

BURNHAM, WILLIAM H.: "The Hygiene of the Nose." *Pedagogical Seminary*, xv. Worcester, Mass.: Florence Chandler, June, 1908. $1.50.

CRONIN, JOHN J.: "The Doctor in the Public Schools." *The Review of Reviews*. New York City: The Review of Reviews Co., April, 1907. 35 cents.

CURTIS, ELNORA WHITMAN: "Outdoor Schools." *The Pedagogical Seminary*, xi., 3. Worcester, Mass.: Florence Chandler, June, 1909. $1.50.

HENDERSON, CHAS. HANFORD: "Outdoor Schools." *World's Work*, xviii., 17. New York City: Doubleday, Page and Co., January, 1909. 25 cents.

LEE, JOSEPH, AND CURTIS, MARGARET: "Medical Inspection in the Public Schools." *Leaflet* No. 7. Boston, Mass.: Massachusetts Civic League, 1906. For distribution.

LEE, JOSEPH, AND CURTIS, MARGARET: "Physical Welfare of School Children." Report of New York Committee on Physical Welfare of School Children. *American*

Statistical Association Quarterly. Boston, Mass.: American Statistical Association, 491, Boylston Street. $1.

Much valuable data will be found in various Official Reports. The following Government, State, and Municipal Reports may be consulted with advantage:—

CLEVELAND, OHIO: Annual Report of the Superintendent of Schools, 1907.

COMMISSIONER OF EDUCATION: Report of the Commissioner of Education, 1897-8, vol. ii. "Medical Inspection of Schools," pp. 1489-1512.

COMMISSIONER OF EDUCATION: Report of the Commissioner of Education, 1902. "Medical Inspection of Schools Abroad," pp. 509-526.

COMMISSIONER OF EDUCATION: Report of the Commissioner of Education, 1902. "Report of Committee on Statistics of Defective Sight and Hearing of Public School Children," pp. 2143-2155.

COMMISSIONER OF EDUCATION: Report of the Commissioner of Education, 1906. "Medical Inspection of School Children," vol, i., p. 327.

LOS ANGELES, CAL.: Annual Report of the Board of Education of the City of Los Angeles, Cal., 1906-7.

MARTIN, GEORGE H.: "School Hygiene in Massachusetts." Reprinted from the 71st Report of the Massachusetts Board of Education, Boston, Mass., 1908.

NEW YORK CITY, N.Y.: Ninth Annual Report of the City Superintendent of Schools, 1907.

NEW YORK CITY, N.Y.: Tenth Annual Report of the City Superintendent of Schools, 1908.

NEW YORK CITY, N.Y.: "Working Plan of the System of Medical Inspection and Examination of School Children in the City of New York." Department of Health, New York City, 1906.

The above reports may be secured without payment on application to the Government branches publishing them.

A fairly representative bibliography will be found in "Medical Inspection of Schools" by LUTHER HALSEY GULICK and LEONARD P. AYRES. New York City: Charities Publication Committee, 105, East 22nd Street, 1908, $1.00.

XXVI

PHYSICAL EDUCATION IN AMERICAN UNIVERSITIES

BY

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THE recognition of the physical needs of students has been one of the most noteworthy facts of college education in the United States of America. From 1860, when Amherst College introduced compulsory physical education, till 1890 only twenty-one educational institutions required it; from 1890 to 1906 the number had increased to fifty-seven; and recent statistics show that 90 per cent. of the seventy-three leading colleges and universities now require physical education of freshmen, 78 per cent. require it of freshmen and sophomores, 30 per cent. of the three lower classes, and 12 per cent. of all four. The department of physical education is, as a rule, equal in rank and importance to the other departments.

ORGANISATION OF PHYSICAL EDUCATION.

In each centre the work of the physical education department is under the supervision of a director, whose training includes a medical course and special preparation or post-graduate work in physical education at one of the normal schools on the subject. He directs the policy of the department, makes medical examinations, plans courses of exercise and lectures on the theory of physical training and

personal hygiene. On his staff is a college physician, an ophthalmologist, and other specialists, who make routine examinations and can be consulted, when necessary, together with instructors in gymnastics, athletics, swimming, fencing, boxing, and other physical specialities.

The work is both theoretical and practical. The theoretical work consists of lectures on such subjects as anthropometry, physiology of exercise, personal hygiene, corrective gymnastics, massage, which are given either as optional courses or as part of the regular course in medicine, and counting toward the student's degree.

The practical work consists in systematising and conducting the courses of exercise in the gymnasium, swimming pool, and athletic field, making the medical and physical examination of all students in the entering class, arranging for the special medical examination of aspirants for athletic teams, the re-examination of men at intervals during their course, and the prescription of special exercise for correcting any existing physical defects.

The object of such systematic exercise is to train the student in the proper pursuit of those sports and other physical activities with which every healthy educated man should be familiar, to keep in health and to build up the average student whose habits of life while at college are hardly likely to maintain him in the best condition to make the most of his college course, or whose past health or hereditary influences do not give him an even start with his fellows; and to correct the defects of development and posture which will limit his efficiency in after-life.

The Nature of the Medical Examination.

The entering student receives a blank form, on which are a series of questions to be answered by him. These questions begin with inquiries as to his age, the age or cause of death of his parents, hereditary tendencies, general questions as to his habits of life, whether sedentary or active, previous occupation or experience in athletic sports, his ability to swim, and his use of alcohol and tobacco. These questions are so worded as to enable the examiner

to form a fair idea of the undergraduate's former habits of life, and he can of course make such further inquiries as may be necessary. The rest of the form is composed of questions relating to the student's health, beginning by two general questions, and followed by several questions on the digestive system, the genito-urinary system, the respiratory system, the circulation, and the nervous system, concluding with the special senses. They are simply worded and are so arranged that a man without medical training will be able to answer them intelligently. A space is left for any remarks the medical examiner may wish to add. After this form is filled in the student presents himself undressed for an examination, in which special attention is paid to the position of the shoulders and the carriage of the body, the development of the various groups of muscles, the condition of the circulation and respiratory system, both under conditions of rest and during exercise. Acuteness of sight and the hearing are also tested.

The examination is concluded by a series of measurements and tests to determine the strength of the muscles of the back, legs, arms, shoulders, and grip. In this way a complete picture of the student is obtained, and an intelligent course can be more readily designed.

The examination is of value in many ways:—

1. It gives the director an opportunity of meeting personally every student who enters college and of starting him on the right track at the beginning of his course, and so often preventing much subsequent injury and no little loss of strength and time.

2. It furnishes data regarding the defects and weaknesses peculiar to the student or such as are fostered by his special habits and surroundings.

3. It gives a basis for comparison and allows of the accumulation of statistics and the compilation of charts from which the individual can compare his condition with that of the general average.

4. It arouses in the student an intelligent interest in his own physical condition, needs, and progress, especially

when the measurements are taken periodically throughout the university course.

The examination is usually conducted during the first month of the college term. It is generally combined with the teaching of swimming and the giving of prescription work for defects.

Classification of Students.

It is found that the students may be grouped into three chief classes:—

1. *Defectives.* Nearly half of the students entering a university show some defect of development or posture which requires treatment. For them, a prescription of exercise is given to correct the specific fault. These exercises may be done at home or under supervision, and in addition to the ordinary class work. Occasionally a defect is so slight that the undergraduate is allowed to continue in such sports as can be followed without detriment to his general health.

2. *Normal.* To the second class fortunately belong the great majority of the students. They are as a rule men who are not greatly interested in any sport, who have an exacting course at college, and who wish to get the proper amount of exercise with the least possible expenditure of time. For them, a course is designed consisting of two to four periods a week, of one-half hour each, each period beginning with free setting up exercises and marching tactics and concluding with a gymnastic game. After about a month of this work a practical examination is held on four pieces of gymnastic apparatus. Following this examination, the men are graded and a course of ten lessons is given on a set of apparatus, each series of lessons concluding by examinatoin of the work done. Each period's work is composed of apparatus work, such as the rings, horse, parallel bars, buck, and of a free hand drill, a short run, deep breathing exercises, and a game.

In March the work is changed to class exercises in boxing, wrestling, swimming, or single stick, and modified athletics, which are carried on until May. That month is

devoted to re-examination of those whose course is completed.

3. *Specialists*. From ten to twenty per cent. of the students are devotees of some form of sport such as foot-ball, base-ball, or rowing, and the only restriction imposed in their cases is careful medical examination and the prevention of the unfit from taking part in games that would be a menace to their present or future health.

Definite credit is now given for the course in physical training which counts towards the undergraduate's degree. The credit is usually calculated like laboratory work, that is, two hours of work being equivalent to a one-hour lecture.

Credit may be obtained in gymnasium work, in prescription work, and it is allowed to members of the university teams and those trying for them during the period of active practice only. A man who drops out of a football squad must go into the gymnasium classes or take some other course to obtain the necessary credits.

Students frequently follow the gymnastic classes for a year or two and then specialise in sports, thus getting the most valuable training on the best foundation, which is gymnastic exercise.

In Cornell University, credit may be obtained for running or even walking, the student giving in his own statement of time and distance, which is accepted by the department.

The influence on the health of the student's body of such procedure has been shown Amherst, through a series of investigations into the health-rate from the first to the fourth year.

Acceleration of growth has also been demonstrated at the University of Pennsylvania throughout the four-year course by a marked increase in the height, weight, breadth, depth, and girth of the chest over the normal rate of growth in young men of the same age. The improvement also in general efficiency and in the education of those powers and activities which every well-equipped man should possess—the ability to swim, dodge, strike, and

guard, and the like—although more difficult to measure and register on a chart, are, none the less, real and vital to the man who is to do the work of the nation.

In the women's colleges, the courses in physical exercise are modelled on much the same lines, and Vassar, Smith, and Bryn Mawr all have a more or less definite requirement demanding a minimum amount from all students who are not physically incapacitated.

REFERENCES.

The preceding sketch is a mere outline of what is being done for the American student through the instrumentality of systematic medical inspection. For full particulars the writer's recent work may be consulted:—

McKenzie, R. Tait: "Exercise in Education and Medicine." London and Philadelphia: W. B. Saunders Company, 1909. 15s. net.

The Society of Directors of Physical Education in Colleges. (Secretary: Paul C. Phillips, A.B., M.D., Professor of Hygiene and Physical Education, Amherst College) have issued a register of members' works.

A useful bibliograhpy of the literature of Physical Training has been prepared by J. H. McCurdy, M.D., of the International Y.M.C.A. Training School, Springfield, Mass., entitled "Bibliography of Physical Training."

The Department of Physical Education of the University of Pennsylvania also issue a "Gymnasium Manual," published in Philadelphia for the University, giving full particulars of the work of the department. The forms used would probably serve as useful models for British Universities.

During recent years a large number of articles dealing with medical examination and physical education of male and female students have appeared in American journals. References to the most important of these will be found in the *Register* above mentioned.

XXVII

MEDICAL EXAMINATION OF SCHOOLS AND SCHOLARS IN GERMANY

BY

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EDITOR OF *Social Medizin und Hygiene*

THE federal character of the German States Union, and the trend towards autonomous administration wherever this is consistent with Imperial claims, have made it possible for Germany to test the utility of a large number of different systems of school medical service.

In the year 1883, the town of Frankfort-on-the-Main appointed a "school doctor," and in 1888 this example was followed by Breslau. Leipzig, Dresden, Nuremberg and Königsberg were the first towns to institute more elaborate measures for school medical supervision. Wiesbaden has the honour of having supplied the model scheme that gave the final impetus for a general action on the part of a relatively large number of German towns. These took up the matter in earnest and appointed doctors for the hygienic oversight of school children. Dr. Paul Schubert,[1] writing in 1905, stated that 100

[* We are indebted to the skill and kindness of Mrs. Emilia V. Kanthack de Voss for the English translation and general presentation of Dr. Fürst's informing chapter.—EDITOR.]

[1] SCHUBERT, PAUL: "Das Schularztwesen in Deutschland." Hamburg: Leopold Voss, 1905. M.2.50.

towns had already appointed school doctors, numbering 598 in all. In 1908, Professor Leubuscher,[1] the President of the German Union of School Doctors, announced that their number had increased to between 1,500 and 1,600, distributed over 400 German towns, and this number is steadily growing.

The Relations of the School Doctor to the Public Health and other Local Authorities.

In Germany, the appointment of a school doctor is subject to a wide range of administrative variation. Individual States have placed the matter of the examination of schools and scholars to a large extent in the hands of their State medical officials. These officials have many duties to discharge—in some cases in addition to a busy private practice, so leaving little time for the work of school medical supervision. A really systematic State organisation of school medical service only exists in Saxe-Meiningen and in Hesse-Darmstadt, where every school, in both town and country, public and private, is provided with a State-appointed, part-time school doctor.

Except in cases where the school medical service is a *State* organisation and the school doctor is a State official, as in Saxe-Meiningen, he works under the authority of the local executive; this may be the Municipal *Magistrat*, the local Education Committee, or the local Medical Board. The last-named is the mode adopted in Hamburg, and is an arrangement admirably calculated to advance the best interests of school medical supervision. Latterly, the more progressive communities have appointed "communal doctors" (Kommunal Aerzte), to whom the work of school medical supervision is primarily entrusted. These are under the authority of the *Landrat*, who is the highest official of the district executive. It should be stated, however, that in some places—Crefeld, for instance—these communal doctors are still only part-time officials working under the medical officer of health.

[1] Leubuscher: *Medizinische Reform*, No. 49. 1908. Berlin: Allgemeine Medizinische Verlagsanstalt. Yearly volume in 52 parts, M.6.

Where the district medical officers or their assistants combine the duties of school doctor with their public health duties, they may come under the dual authority of municipal and district executives.

In almost every instance, the German school doctor is a part-time official. Only a very few municipalities of moderate size have appointed a whole-time school doctor, who is entitled to a pension. Even these may supplement their salaries with private or sick-club practice. This arrangement exists in Halle, Dortmund, Mannheim, Metz, Chemnitz, Augsburg, and Hagen. Charlottenburg, which takes the lead among all German municipalities in matters of social progress, is planning a re-organisation of the civic medical department which gives prominence to the claims of school hygiene, and it is quite possible that this plan, if carried out, would satisfactorily meet existing deficiencies. Unfortunately, the body of private medical practitioners oppose the new scheme, which is the work of Stadtrat Dr. Gottstein,[1] with so much energy that its realisation is very doubtful.

After weighing carefully the results as yet attained by the different systems, I feel no hesitation in saying that the appointment of adequately paid whole-time school doctors offers the only satisfactory way of meeting the requirements of school medical supervision. The modern development of school hygiene is making it more and more necessary that the work of supervising the health condition of school children should be placed in the hands of an expert who is free from the hampering cares of a competitive livelihood. This view, however, meets with strong opposition in Germany, mainly from the side of the medical organisations.

As regards the remuneration of the school doctor, the widest divergences exist. Whole-time school doctors receive annual salaries varying from 7,000 to 11,000 marks (£350 to £550), with the claim to a pension.

[1] Feilchenfeld, Wilhelm: "Die Gottstein'schen Organisationsbestrebungen für den Aerztlichen Dienst in Deutschen Gross-städten." *Soziale Medizin und Hygiene*, Vol. IV., No. 12, pp. 615-624. 1909.

The complicated subject of the remuneration of part-time school doctors has been admirably dealt with by Dr. Magen of Leipzig.[1] There are three systems of payment, similar to the "Kranken-Kassen" systems. These are (*a*) a fixed annual sum, irrespective of details of work; (*b*) a "lump" sum which bears a ratio to the number of children or classes in the school, to be paid annually; and (*c*) remuneration at so much per child, according to the nature of the work done. The last method is rarely adopted. Sometimes a combination of systems is employed. Where a fixed annual salary is allotted, the work of school medical inspection has generally been added to other official duties. In Magdeburg, for instance, the school doctor is also a Poor Law medical officer, receiving in this dual capacity an annual salary of £50, out of which sum £30 falls to the school medical service. Where the scale of remuneration is per scholar, the average rate is 50 pfennig (6d.) per head per year—ranging from 25 pfennig in Meiningen to 60 pfennig in Brunswick. Where the scale is per class, the payment ranges from 3 to 5 marks for each class. Some towns offer a fixed salary plus certain extras; Wiesbaden, for instance, grants an annual salary of £30, and, for the examination of children in the second, fourth, sixth, and eighth school years, pays an extra sum which is proportionate to the number of children examined, 20 pfennig being reckoned for each child.

The Relation of School Doctors to Teachers.

The relations between school doctors and teachers may be described as thoroughly harmonious. There certainly was a time when this was far from being the case. The teachers saw in the new official only a fresh species of inspector, and were by no means prejudiced in his favour. Nor was the behaviour of the new official altogether calculated to overcome this prejudice. Many of the first

[1] Magen: "Schularztbesoldung" in "Schulhygienisches Taschenbuch," pp. 361-366. Hamburg: Leopold Voss, 1907. M.4.

school doctors attacked their new duties over-zealously and were apt to push the actual pedagogic aims of the school—which, after all, have called the school into being—entirely into the background. Fortunately matters adjusted themselves in course of time, and nowadays the German school doctor and the German school teacher work together in a proper spirit of comradeship, having common aims at heart. I have found many of the teachers, indeed, to be fired with an enthusiasm for progress which was far in advance of what executive committees were ready to concede.

School Doctors and the General Medical Practitioners.

The relations between the school doctors and their colleagues in private practice have greatly improved of late, but the latter still regard with strong disapproval any suggestion having reference to the therapeutic treatment of scholars by school doctors, as they think they see in this institution a curtailment of their own practice. The majority of the German private practitioners also view the advocated change from part-time to whole-time school doctors with pronounced disfavour. Speaking from conviction based on personal experience, I am of the opinion that my colleagues are not justified in thinking that they would suffer pecuniary detriment from either of these directions. Such treatment of sick school children as may eventually be placed in the hands of the school doctors will not deprive the private medical practitioners of many profitable patients; while, on the other hand, the whole-time school doctor would be instrumental in bringing about a much more thorough system of school medical inspection which would indirectly work round to the benefit of the private practitioner.

The Functions of the School Doctor.

To undertake a detailed account of the functions of the school doctor in Germany is an impossibility. The

Wiesbaden Regulations probably serve best as a model. They run as follows:—

The School Doctor must examine all children entering school in order to determine whether they require continuous medical supervision, and whether any exemptions from the daily programme of school work are called for.

Prior to this thorough physical examination, which is to take place within the first six to eight weeks of school life, entrants must be superficially examined within the first week in order to schedule data concerning presence of parasites, past history of infectious disease, etc., as well as to exclude children obviously unfit for ordinary school attendance.

A Health Schedule is filled in for each child, spaces being provided for making entries at proper intervals throughout school life.

Where a child requires continuous medical supervision, the words "*Medical Control*" are to be written on the top right-hand corner of the first page of his schedule.

Where a child is described as "feeble," he is to be regarded as being under medical control until the School Doctor expressly states that this is no longer necessary.

A physical examination on the same lines as the initial examination is to be made in the second, the fourth, the sixth, and the eighth year of school life. These are to be made in the Winter Terms. In filling in the Schedules on these occasions special reference is to be made to changes occurring in previously noted disease-conditions.

The School Doctor attends each school once a month, having previously arranged the time with the Head Master.

The first part of the medical visit is to be devoted to inspecting the children in the class-room during school work, ten to fifteen minutes sufficing for one class. Each class must be visited at least once during each half-year. In the course of these visits, each child is subjected to a brief survey, the teacher being privately consulted about any abnormal indications. Individual children whose appearance is not satisfactory are marked to be sent to the consulting room later on.

A general survey of the school premises and their internal arrangements, of the ventilation and heating methods, and of the general appearance of the children, their carriage, etc., is made at the same time.

The second part of the visit is devoted to the more thorough examination of individual cases.

Teachers are requested to bring forward children from other class rooms whenever appearances indicate the necessity for doing so, particularly where suspicion of infectious disease exists.

The *medical treatment* of school children does not enter into the province of the School Doctor.

Where medical treatment is called for, the parents of the child are to be informed of the fact. In the case of very young children, and in cases where verbal messages have been ignored, special

printed Notices are filled in. The Head Master is charged with the duty of forwarding such Notices to the parents.

All cases of infectious disease, particularly of scarlet fever or diphtheria, which are notified to the Head Master by relatives, medical practitioners, or police authorities, are to be reported to the School Doctor without delay. He shall thereupon thoroughly inspect the entire class to which the patient belonged, the children who occupied seats near him being subjected to a particularly close scrutiny.

All "suspects" discovered during this inspection are to be sent home and kept under observation for a few days.

Orders for class or school closure, disinfection, etc., must be sent by the Senior School Doctor to the Local Sanitary Authority.

The Head Masters are encouraged to apply to the School Doctor for advice or information in all circumstances affecting the hygiene of the scholar that may occur apart from the ordinary routine of inspection (*e.g.*, in the case of sudden injuries, suspicion of infectious disease, etc.).

The School Doctor is required to inspect the school premises at least once in the summer and once in the winter. He may not, however, direct any orders to the Head Master or teachers, school porters, or other officials.

In urgent cases he must lodge complaints with the Government School Inspector, and where such complaints deal with purely sanitary matters, a duplicate notice must be sent to the local Medical Officer of Health.

School Doctors are required to send in their Annual Reports to their Senior Officer not later than May 1st, for which purpose a special printed Report Sheet is provided, which is to be minutely filled in.

The Senior School Doctor is required to draw up a general summary, which he must send to his authority, together with the individual reports, not later than July 1st.

The regulations for the town of Hamburg distinguish themselves from all others in that the school doctor comes into closer co-operation with the Medical Board. On the appearance of an epidemic, for instance, the school doctors, who are generally selected from among medical assistants to the Medical Board, may be empowered to deal with the exigencies of the situation.

Efforts are now being made to introduce uniformity of method into the mass of German school medical regulations, instructions, schedules, etc., and this uniformity is desirable just so far as it is consistent with a proper consideration of local conditions. As school medical inspection deals entirely with practical matters, I consider it far more important that local conditions should receive

an intelligent consideration than that these should be sacrificed to a desire for rigid uniformity. Certainly as long as school medical inspection is divided up among a host of part-time officers, even a moderate degree of uniformity is unattainable.

School Baths.

Reference must be made to the important question of personal cleanliness among school children. This matter is, of course, largely influenced by the social position of the children, though it by no means follows that the wage-earning capacity of the family stands in direct ratio to their degree of cleanliness. As cleanliness is the foundation of hygiene, the school doctor cannot attach too much importance to it. His scope for dealing with this question directly is very limited, but much may be done indirectly through the school. The best means of promoting cleanliness will certainly be found in the provision of school bathing arrangements.[1] In Breslau, sixteen elementary schools have shower baths installed, and the children from sixty-three schools use these during the winter months, both as a cleansing and as a refreshing process. Every class is enabled to have one bathing day monthly, and each class occupies the bath for one hour. No direct pressure is brought to bear upon the children in the matter of bathing, but the baths are growing in popularity. A regrettable reluctance to use the baths is frequently observed among the older girls, which is less due to timidity than to a feeling of shame with regard to their often very defective underclothing. Swimming instruction to elementary school children is fortunately becoming very general.

[1] The following works should be consulted :—

Lassar, Prof. : "Das Schulbad" in "Schulhygienisches Taschenbuch," pp. 255-260. Hamburg : Leopold Voss, 1907. M.4.

Schleyer, W. : "Bäder und Badeanstalten," pp. 748. Leipzig : Carl Scholtze, 1909. M. 34.

See also *Report of the Education Committee of the London County Council* on Bathing Arrangements in Germany and Holland. London : P. S. King and Sons, July, 1906. 6d. Also *Kommunales Jahrbuch.* Edited by Lindemann und Sudekum. Vol. II., Part I., pp. 331-334. Gustav Fischer, Jena, 1909. M.18, 2 vols.

Pediculosis appears to be a universal plague in the girls' classes, judging from the unanimity of the yearly reports on this point. When the matter becomes so intolerable that the clean children suffer, drastic remedies may be resorted to in the interests of public health. Unfortunately, so much red tape has to be unwound before the public cleansing station can be put into requisition that this most salutary corrective is not applied as often as might be advisable. In Mannheim, the bare fact that a ministerial verdict has been given in favour of applying forcible cleansing measures has had a most satisfactory deterrent effect.

School Nurses.

There are as yet very few school nurses in Germany, Charlottenburg and Stuttgart being the only towns employing them. In Charlottenburg the school nurse is required to act as an intermediary, and to make domiciliary visits in the case of dirty (verminous) children, insufficiently clothed, or obviously ill-nourished children. She must acquaint herself with the economic conditions of the family and, if possible, give practical advice. She may undertake the thorough cleansing of a child's head. If, however, the clothing, dwelling, etc., are found to be verminous, a radical disinfection of the entire premises is carried out by the municipality. In the case of ill-nourished children the school nurse must procure accurate information regarding their home-feeding. That the school doctor should have trustworthy information on this vital point is a matter of very great importance.

School Feeding.

Strictly speaking, school feeding does not come into the province of the school doctor, but it is absurdly illogical to expect any good results to arise from the hygienic supervision of half-starved bodies. The Central Committee for Public Welfare in Berlin instituted an inquiry into the alimentation of school children, the results of which have been published by Dr. Kaup and Professor

Rubner.[1] This work gives an exhaustive survey of the causes of malnutrition among school children, a condition from which a very large proportion of them suffer in the bigger towns. The causes are mainly economic and domestic, and include the following: Persistent poverty or unemployment, death or illness of one parent, the mother going out to work, laziness, drunkenness, etc., of the parents, employment of children themselves, large families, and long way to school.[2]

Over two hundred towns have instituted the feeding of necessitous school children, four classes of school feeding being adopted: (1) lunch only, (2) dinner only, (3) lunch and dinner, and (4) breakfast, lunch and dinner. Meals are given for periods varying from one to twelve months, but most of the schemes apply only to the winter months. The necessary sums are generally drawn from private sources (philanthropic individuals or societies, lodges, etc.), and these are sometimes supplemented by municipal grants. These philanthropic schemes owe their existence largely to the enthusiastic energy displayed by the body of German teachers.

Physical Deformities.

The prevention of lateral curvature and similar conditions can, to a large extent, be encompassed by the

[1] Kaup and Rubner: *The Alimentation of Elementary School Children* ("Die Ernährungsverhältnisse der Volksschulkinder"). Report and Transactions of the Third Conference on Public Welfare, held in Darmstadt, May 24th to 26th, 1909. Pp. 170. Berlin: Carl Heymann, 1909. M.3.60.

[2] Simon, Helene: "Schule und Brot." Second edition. Hamburg: L. Voss, 1908. M.1.20.

In Section III. (Hygiene of Childhood and School Life) of the XIVth International Congress for Hygiene and Demography, held in Berlin, 1907, Dr. Bernhard read a paper on the Alimentation of the Berlin Elementary School Children. His facts were based on reports on 8,451 children taken from the central district of Berlin. He stated that 6.8 per cent. of the children came to school *almost* breakfastless, and 0.5 per cent. without any breakfast at all; 82.6 per cent. had coffee for breakfast, 27.4 per cent. had cocoa, milk or soup, 7.2 per cent. had dinner in the evening, and 0.04 per cent. got nothing in the shape of a dinner. In 70 per cent. of the cases, the lack of breakfast was due to late rising or careless parents; loss of appetite in 18.7 per cent., poverty in 4.8 per cent., illness of mother in 1.7 per cent., and early morning employment of the children in 10.9 per cent.

employment of appropriate physical exercises, both during school hours and out of school, but always under medical direction.[1] Indirectly, the now generally obligatory swimming-instruction, half-holidays in the play-grounds, and school tours are also valuable preventive forces. Latterly, the experiment has been made of strengthening the children by means of physical exercises in the open air during the recreation pauses. Personally, I consider such exercises out of place, and hold the belief that children will derive the greatest benefit from the recreation pause by romping about to their heart's content and using their limbs and lungs as nature prompts them. Very few children are now dispensed from physical drill, and these only for weighty reasons. In several States (Prussia, Saxony, Baden) the clothing of girls in the gymnasium has been officially regulated, and, in particular, the wearing of stays is forbidden. Many towns have instituted special orthopædic classes for children with pronounced scoliosis.'[2]

The Nature of the Medical Examination.

The children are generally examined in the classrooms, which are anything but suitable for this purpose. The

[1] Schulthess, Wilhelm: "Die Skoliose" in *Schulhygienisches Taschenbuch*, pp. 195-201. Hamburg: Leopold Voss, 1907.

[2] *In 1908, Mainz* set apart 6,000 marks for the treatment of scoliotic school children. A special meeting of the School Committees and the School Doctors was held, the advisability of organising special classes for scoliotic children which would allow a more "intensive" system of physical exercises to be carried out was thoroughly discussed, and preparatory steps were arranged. In Düsseldorf special orthopædic drill courses were also arranged, the results being as follows:—In the first course, 35 per cent. of the children (those with incipient scoliosis) were cured, 33 per cent. showed marked improvement, 20 per cent. improved, and only 11 per cent. (being cases of pronounced scoliosis) were unaffected. In the second course, 51 per cent. were cured, 34.8 per cent. showed marked improvement, and 1.4 per cent. improved. Charlottenburg has made similar arrangements; also Chemnitz. In Breslau, orthopædic treatment is given to scoliotic school children in the medico-mechanical department of the Allerheiligen Hospital. In Sonneburg, in Thuringia, forty-one scoliotic girls divided into two classes received weekly two hours' instruction in physical exercises under the superintendence of the school doctor. Influenced by these results the Prussian Ministry of Education issued a circular on April 12th, 1908, recommending a general adoption of these measures. See *Kommunales Jahrbuch*, Vol. II. Jena: G. Fischer, 1909. M.18. 2 vols.

more progressive communities have set apart special rooms for the use of the school doctor. Under ordinary circumstances, however, the examination is conducted as follows: A teacher assists the school doctor by writing on the Health Schedules at his dictation. The children, who have been previously weighed and measured, approach the doctor in turn, stripped to the waist (including the younger girls). Their general condition is noted, then the breast measurement taken; the neck is palpated and glandular swellings, enlarged thyroid, etc., are noted; the oral cavity is inspected and the condition of the teeth, the tonsils, presence of adenoids noted; the nasal and aural openings are superficially inspected, and if suspicious appearances present themselves, a more thorough examination of these is made. The back is now inspected, particular attention being paid to the spine; then the head and hair are looked at. Where appearances of illness present themselves or the child complains of pain, etc., a more thorough physical examination is made, cases which cannot be satisfactorily diagnosed in the presence of the more or less fidgety class being reserved for a private examination after the others have been dismissed. The child is told to walk the length of the classroom, and its movements are observed. The sight and hearing are then superficially examined. Many of my colleagues adopt the method of setting apart special days for the wholesale examination of sight and hearing, but I prefer to examine each individual completely before going on to the next, as I see certain advantages in this method. I place much value on the opportunity afforded for maintaining a lively conversation with each child. Apart from the fact that this enables me to "spot" any speech-defects, the presence of adenoids, etc., I also learn something about the mental capacity of the child, his domestic circumstances, etc., and gain a chance of winning his confidence.[1] Sickly or defective children receive a

[1] I seek for information on the following points:—(*a*) Does he work for pay, how long, how much pay, how is the money spent? (*b*) The condition of the books and school requisites that he takes home. (*c*) Does he sleep in a separate bed, if not, with whom? (*d*) In the case of girls, are stays worn? (utilising the occasion for a word in season). Above all, I

notice addressed to their parents, recommending the procuring of proper medical advice. If the child is verminous the parents receive instructions for getting rid of the parasites.

Children with organic defects and those who are debilitated are placed under special supervision and are called *Ueberwachungskinder*. At each recurring inspection these children are objects of special attention, and inquiries are made as to whether the "recommendation" sent to the parents to procure medical treatment for them has been acted upon. Should they have neglected this instruction, they are again and again urged to do their duty as parents, but there is no legal compulsion on this point. In such cases, the teachers are often of great value in persuading the parents to carry out the school doctor's injunction; where school nurses are appointed this duty devolves upon them.[1]

Special Schools.

Children who do not reach the general standard of mental capacity are weeded out by the school doctor and sent to special classes or schools where methods of teaching are employed which are adapted to their lower grade of intelligence or to their physical disabilities.

The number of towns which provide special teaching for defective children is steadily increasing. According to a report in the fortnightly Journal, *Die Hilfsschule*, 1908, about 200 German towns have established Special Schools. In fifty-two towns with less than 20,000 inhabitants Special Schools are being instituted. Among the larger towns:—

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make it a point to speak in strong terms about the mischief that may result from resorting to "quacks," bogus "doctors," and such people, and where the child is given a message for his parents urging them to seek medical advice for him, I lay great stress on the necessity for going to a *real* doctor. See "Die Bekämpfung der Kurpfuscherei durch die Schulärzte." *Zeitschrift für Schulgesundheitspflege*, Vol. XXII., 1909. Abteilung: Der Schularzt. Hamburg: L. Voss. M.12 annual subscription.

[1] The first Stuttgart Report on the work of the school nurse states that 700 children were visited, and that in 50 per cent. of the cases the parents were induced to adopt the recommendations of the school doctor.

		Inhabitants.	
15 out of 52	towns with	20-25,000	have Special Schools,
16 out of 38	towns with	25-30,000	
30 out of 46	towns with	30-40,000	
9 out of 18	towns with	40-50,000	
24 out of 34	towns with	50-75,000	

while not one of the fifty-four towns with more than 75,000 inhabitants is without such institutions.[1]

School Statistics.

A few figures on this subject may be of interest. In 1909, April 1st, Berlin, with a population of 2,100,000, had 299 free schools with 5,158 classes and 228,573 scholars (113,269 boys and 115,304 girls), being an average of 45.3 scholars to each class. The school medical supervision is in the hands of forty-four part-time school doctors.

In Hamburg, with a population of 854,472, there are 160 elementary schools with 2,345 classes and 110,466 scholars (57,975 boys and 52,491 girls); the average is 45 scholars to each class. In the ten Special Schools for mental defectives, 1,392 children (780 boys and 612 girls) are taught in 71 classes, the average being 20 scholars to a class. In addition to the ordinary schools, 391 children are taught in the State Orphan Asylum (282 boys and 109 girls), the school having 11 classes, with an average of 37 to a class. Ten part-time school doctors are appointed in Hamburg.

The school age in Germany covers the eight years from six to fourteen.

Country Schools.

The country schools are still, to a very large extent, outside the scope of school medical inspection, though it has been asserted by experts that they stand in far greater

[1] *Kommunales Jahrbuch*, Vol. II., Part I., 1909.

Dr. J. Moses (Mannheim) contributed an excellent paper on the Mannheim System of Special School Teaching to the first International Congress on School Hygiene. Pp. 70. 1904. Published by J. Bensheimer, Mannheim.

need of it than even the town schools. This should not surprise anyone comparing the medical statistics of town and country populations in Germany, for the country districts still lag far behind the towns in hygiene and sanitation. In Saxe-Meiningen and Hesse-Darmstadt, however, the rural children are inspected as systematically as the town children.

Secondary and Private Schools.

With the exception of those in Saxe-Meiningen, Hesse-Darmstadt, and a few large cities, the upper and private schools are exempt from inspection. This is the more regrettable as these schools stand very much in need of hygienic enlightenment.[1] The private schools, in particular, are very backward in this respect, and many attempts have been made to bring the matter into public prominence, chiefly by doctors and teachers. But no success has as yet attended these efforts, chiefly owing to the strenuous opposition shown by the owners of private schools to any form of medical inspection, which they would appear to regard with extreme horror.

The Scholar's Health Schedule.

In many districts the Health Schedule (*Gesundheitsschein*) of each boy leaving school is placed at the disposal both of the judicial and of the military authorities for purposes of future reference. Such medical data may prove to be of great value in cases of organic disease, neuropathic criminal tendencies.[2]

It hardly needs pointing out that the school doctor may be of great service both to the boys themselves and to

[1] Dornberger, Eugen, und Grassmann, Karl: "Unsere Mittelschüler zu Hause." Schulhygienische Studie. Nach Erhebungen an Münchener Mittelschulen, veranstaltet durch die Schulkommission des Aerztlichen Vereins, München. Pp. 208. Munich: J. F. Lehmann, 1908. M. 5.
Hartmann, Martin: "Der Schularzt für höhere Lehranstalten." Eine notwendige Ergänzung unserer Schulorganisation. Pp. 32. Leipzig: B. G. Teubner, 1906. 80 pfennig.

[2] Fürst, Moritz: "Ein Vorschlag zur Nutzbarmachung Schulgeshundheitsscheine." *Soziale Medizin und Hygiene*, Vol. III., pp. 62-66. Hamburg: Leopold Voss, 1908.

their parents in assisting them with his advice regarding the choice of a trade that is physically suitable to the individual in question. In Strassburg, Halle, and some other towns, special days are set apart for these friendly consultations. Where such an arrangement does not exist, many informal opportunities present themselves for talking this matter over. In Hamburg, "Parents' Evenings" are held periodically, on which occasions the school doctor gives a practical lecture on hygienic subjects before an assemblage of teachers, older scholars and their parents, and these are particularly suitable for this purpose.[1]

The School Medical Reports.

In the majority of localities the school doctor submits a yearly report to his committee (the Education Committee, Medical Board or Public Health Authority, as the case may be). These reports display the utmost variety of form, and some authorities publish them, while others do not. The body of school doctors are striving for a greater uniformity in the manner of compiling these reports, the most prominent representative of this movement being Dr. Oebbecke, the head of the school medical service in Breslau.

Conclusion.

In bringing this brief sketch of the state of school medical service in Germany to a conclusion, I must emphasise the fact that we have as yet confined our efforts to *medical inspection*, and have gone only a little way towards the *medical supervision* (*Ueberwachung*) that we aim at and towards which inspection is only the preliminary step. An equally regrettable fact is the failure on the part of governing bodies to include the hygienic supervision

[1] Fürst, Moritz: "Mitwirkung des Schularztes bei der Berufswahl" in *Schulhygienisches Taschenbuch*, pp. 349-356. Hamburg: Leopold Voss, 1907.
Abel, Geh. Medizinalrat R.: "Elternabende" in *Schulhygienisches Taschenbuch*, pp. 356-360. *Ibid.*
See also Keeling, F.: "The Labour Exchange in Relation to Boy and Girl Labour," Chap. III., "German Experiments," pp. 39-52. London: P. S. King, 1910. 6d.

of the *school-buildings* among the more important duties of the school doctor. At best, he may only report disorders and deficiencies to those authorities who are supposed to be competent to deal with them. In my opinion, scholars and schools belong together, and the health of the former can only be properly guarded where the hygienic supervision of both rests with the same authority.

In Mannheim and in Halle we have at last excellent models of how things ought to be done to secure for the whole of Germany a uniform system of school medical supervision intelligently based on broad, practical lines.[1] For the larger towns the appointment of adequately-paid whole-time officers would appear to be an essential necessity, while in the small country towns and scattered rural districts part-time officers may possibly meet the requirements of the case.

REFERENCES.

The literature of German works dealing with school life is enormous. The following is only a select bibliography:

Baginsky, A.: "Handbuch der Schulhygiene." Stuttgart: F. Enke. Vol. i., 1898, M.18; vol. ii., 1900, M.12.

Biesalski, Conrad: "Krüppeltum und Krüppelfürsorge in Deutschland." Hamburg: Leopold Voss, 1909. 4to. M.30.

Bösbauer, H., Miklas, L., and Schiner, H.: "Handbuch der Schwachsinnigenfürsorge mit Berücksichtigung des Hilfsschulwesens." 2nd edition. Leipzig: B. G. Teubner, 1909. M.4.

[1] It is impossible to enumerate here the many German institutions organised for supplying the needs of scohol children, as their name is legion. Among these, the "Kinderhorte" (Children's Recesses) fulfil a most excellent purpose, and deserve special mention. They are intended to offer a home-like shelter out of school hours to children whose parents are at work all day, or whose home conditions are wretched. They are generally open from 4 p.m. to 7 p.m., and the children receive a simple meal, play games, do their home lessons, and are taught some light handiwork. In winter the schoolrooms are used for this purpose, while in summer the open air is patronised as much as possible. The supervision of the children is often undertaken by private ladies.

Burgerstein, L., and Netolitzky, A.: "Handbuch der Schulhygiene." 2nd edition. Jena: Gustav Fischer, 1902. M.22.

Burgerstein, L.: "Schulhygiene." 2nd edition. Leipzig: B. G. Teubner, 1910. M.1.25.

Frenzel, F.: "Die Hilfsschulen für Schwachbegabte." Hamburg: Leopold Voss, 1903. M.1.

Fürst, Moritz, and Pfeiffer, E.: "Schulhygienisches Taschenbuch." Hamburg: Leopold Voss, 1908. M.4.

Kielhorn, Heinrich: "Erziehung und Unterricht Schwachbefähigter Kinder." Halle: Carl Marhold, 1909. M.2.

Laquer, L.: "Die ärztliche Feststellung der verschiedenen Formen des Schwachsinns in den ersten Schuljahren." 2nd edition. Munich: Otto Gmelin, 1909. M.1.20.

Lorentz, Friedrich: "Sozialhygiene und Schule." Hamburg: Leopold Voss, 1906. M.2.50.

Maennel, B.: "Vom Hilfsschulwesen." Leipzig: B. G. Teubner, 1905. M.1.25.

Poelchau, Gustav: "Anleitung für die Schulärztliche Tätigkeit." Hamburg: Leopold Voss, 1908. M.2.50.

Schlesinger, Eugen: "Schwachbegabte Schulkinder." Stuttgart: F. Enke, 1907. M.2.

Schmid-Monnard, Karl, and Schmidt, R.: "Schulgesundheitspflege." Leipzig: R. Voigtländer, 1902. M.2.40.

Schubert, Paul: "Das Schularztwesen in Deutschland." Hamburg: Leopold Voss, 1905. M.2.50.

Stadelmann, Heinrich: "Aerztlich-pädagogische Vorschule auf Grundlage einer biologischen Psychologie." Hamburg: Leopold Voss, 1909. M.5

Wehmer, R.: "Enzyklopaedisches Handbuch der Schulhygiene." Leipzig and Vienna: Pichlers Witwe & Sohn, 1903. M.25.

The following periodical literature will be found of service:—

Das Schulzimmer. Charlottenburg: Johannes Müller. From 1903. Yearly volume in four parts. M.5 (including postage).

Deutsche Vierteljahrsschrift für öffentliche Gesundheitspflege. Brunswick: F. Vieweg & Sohn. From 1869.

Eos. [Vierteljarsschrift für die Erkenntiss und Behandlung jugendlicher Abnormer.] Vienna and Leipzig: Pichlers Witwe & Sohn. From 1905. Yearly volume in four parts. M.10.

Gesunde Jugend: Zeitschrift für Gesundheitspflege in Schule und Haus. Leipzig: B. G. Teubner. From 1901. Yearly volume in twelve parts. M.5.

Internationales Archiv für Schulhygiene. Leipzig: Wilhelm Engelmann. From 1905. Yearly volume in four parts. M.20.

Soziale Medizin und Hygiene. Hamburg: Leopold Voss. Yearly volume in twelve parts. M.16.

Zeitschrift für Kinderforschung. Langensalza: H. Beyer & Söhne. From 1895. Yearly volume in twelve parts. M.4.

Zeitschrift für Krüppelfürsorge. Hamburg: Leopold Voss. Yearly volume in four parts. M.12.

Zeitschrift für Schulgesundheitspflege. With a Supplement: "Der Schularzt." Hamburg: Leopold Voss. Yearly volume in twelve parts. M.12. (Completed its twenty-second year January 1st, 1910.)

The relation of the school to tuberculosis has been admirably dealt with by Geh. Ober-Medizinalrat Professor M. Kirchner. See "Die Tuberkulose und die Schule." Berlin: Richard Schoetz, 1906. 80 pfennig. "Die Tuberkulose in der Schule, ihre Verhütung und Bekämpfung." Berlin: Richard Schoetz, 1909. 60 pfennig. See also "Das Wesen der Tuberkulose als Volkskrankheit und ihre Bekämpfung durch die Schule." Eine Anweisung für die Lehrerschaft. By Professor Nietner und Friedrich Lorentz. Verlag des Deutschen Zentral-Komitees zur Bekämpfung der Tuberkulose. Berlin, 1909.

The following reports and works in English should also be consulted:—

MACKENZIE, W. L.: "The School Doctor in Germany" in "The Health of the School Child." London: Methuen and Co., 1906. 2s. 6d.

ROSE, F.: "Use of Shower Baths in Schools in England and on the Continent." London: J. and A. Churchill, 1906. 1s.

WEHRHAHN: "Der Stand des Unterrichts für Schwachbefägigte in Deutschland." Second International Congress on School Hygiene. London, 1907. Vol. ii., pp. 717-725. London: Royal Sanitary Institute, 1908. 5s. each vol., 12s. 6d. set of three vols.

"School Doctors in Germany." Board of Education educational pamphlet, No. 4. London: Wyman and Sons Ltd., 1906. 6d.

Special Report on "School Gardens in Germany." Reprint of No. 6 in Vol. ix. of Special Reports on Educational Subjects of Board of Education. London: Wyman and Sons Ltd., 1902. 3d.

Special Reports of Board of Education. Vol. xxii. Provision made for children under compulsory school age in Belgium, France, Germany, and Switzerland [Cd. 4477]. London: Wyman and Sons Ltd., 1909. 1s. 3d.

XXVIII.

MEDICAL EXAMINATION OF SCHOOLS AND SCHOLARS IN FRANCE

BY

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To France probably belongs the honour of instituting the first scheme for the medical inspection of schools. On June 26th, 1783, Sieyès, Daunou, and Lakanal submitted the following to the National Convention: "A district health officer should be entrusted with visiting each quarter the national schools of the district. He should examine and give advice regarding the most suitable gymnastic exercises. He should examine the children and lay down general and detailed rules for the safeguarding of their health." But this recommendation could not be carried into effect during the years of revolution. In 1803 and 1809, physicians chosen by the head-masters were appointed especially to attend to the residential pupils in academies and colleges.

THE INSPECTION OF ELEMENTARY SCHOOLS.

In Paris in 1834, a doctor was appointed to each boys' school. In 1843 the inspection was regulated and extended to girls' schools. But as the doctors received no salary their help was never definitely guaranteed.

[1] We are indebted to Mrs. T. N. Kelynack, M.B., Ch.B., for the English translation of Dr. Dufestal's valuable chapter.—EDITOR.

The actual formation of the School Medical Service of Paris dates from 1879, and was completed in 1883. It is the organisation which still does duty in Paris, but which will be replaced on October 1st, 1910, by the arrangement to which we shall refer later.

At the present time (January, 1910) Paris is divided into 126 educational districts, having at the head of each a medical inspector of schools, appointed for a period of three years, but eligible for re-election. The medical inspector is expected to visit the schools in his district at least twice a month, and also to pay extra visits in times of epidemic or when desired to do so by the administration.

On arrival, the doctor, accompanied by the school superintendent, first of all inspects the lobbies, playground, sanitary conveniences, etc., and then the class-rooms. After having satisfied himself as to the hygienic conditions of the class-rooms as regards lighting, warming, ventilation, furnishing, and the like, he proceeds to inspect the children, paying especial attention to those whom the teacher points out as having shown signs of indisposition. The results of his visit are entered by the doctor in an official register. After notifying anything that bears upon the material condition of the school, he reports upon any absent children, stating the cause of their absence according to the information supplied by the superintendent.

Once a month the doctor proceeds to a "careful and individual" examination (according to the regulations) of teeth, eyes, ears, and general condition. When an infectious case is discovered, notice is sent to the family. As a matter of course the doctor sends away any child in whom he discovers signs of infectious disease. A letter is sent to the parents giving the reason for its removal. The child is not allowed to return to school after absence through illness without a certificate from the medical inspector to the effect that he will not be a source of danger to the rest of the scholars. On certain days and hours the doctor receives the children at his own house to give them certificates permitting their return to school.

Within twenty-four hours following his visit of

inspection the doctor is expected to forward to the President of the District Council a report regarding the sanitary condition of the institution he has visited.

In 1885 the medical school service was extended to the suburbs of Paris, where it is now worked by fifty-seven doctors.

In the provinces the service of medical inspection varies according to the locality. The large towns have usually a well-organised system of school inspection. Le Havre, Bordeaux, Marseilles, Lyons, all possess medical inspectors of schools. The system followed is in most respects similar to that of Paris.

The Educational Act of October 30th, 1886, supplemented by the decree of January 18th, 1887, fully established the legal position of medical inspectors. But until recent years the doctor only concerned himself with the prevention of contagious diseases. His duties were restricted rather to attention to the school as a whole than to the care of the individual scholars.

For some years one town in France has undertaken the individual examination of its school children. In Nice, thanks to the initiative and energy of Dr. Cesar Roux, a separate health report has been provided of each pupil in the schools.

We may at once mention that next October the medical school service in Paris will be considerably altered. The scheme voted by the Municipal Council includes the appointment of eighty-four extra physicians, who will be added to the 126 already in office, thus making a total of 210 school medical officers, who will conduct the work of medical inspection in the public schools. These new inspectors will be elected by competition on a programme fixed beforehand, and which will include two series of tests: (1) A written composition on some branch of children's diseases and school hygiene; (2) a practical test such as the inspection of a school or class, or the examination of scholars, etc.

Each doctor will have supervision over not more than 1,000 children. He will be required to make a weekly

visit to each school on fixed days and hours. During this visit he will inspect yards, playgrounds, canteens, sanitary conveniences, and examine the state of the water closets. Then, after observing the hygienic conditions of the class-rooms as regards lighting, heating, ventilation, furnishing, and the like, he will be expected to notice the general attitude of the children and choose places for those who are short-sighted or who have defective hearing. Lastly, he will select those children who seem to require special examination, and these will be sent to his private room to be submitted to a more thorough examination.

After this general inspection, the doctor will proceed to his private room, where he will examine (1) All those children who appear to him to be suspicious or sickly cases; (2) all those pointed out to him by the masters; and (3) all those who have been absent from school for more than three days without a known cause.

The doctor will note on the scholar's medical report form particulars regarding all morbid conditions which he may discover.

But the most important reform in the individual examination of children is the institution of a special health sheet for each pupil.

Every child will be examined during the first months of his or her school life. The examination will include: (1) Measurement of height, weight, and chest circumference; (2) the functions brought into use by school work, viz., sight and hearing; and (3) examination of the principal organs of circulation and respiration, the skeleton, the vertebral column, the scalp, the skin, etc.

Everything which the doctor ascertains will be entered on the scholar's health sheet. Parents will be informed of any ailments discovered in their children, and will be requested to have them promptly attended to, but the school doctor is forbidden to act as a medical attendant to the scholars or to give any advice as to treatment. Measurements of height and weight are to be made every six months under the supervision of the medical school officer, and he will be responsible also for re-vaccinations.

The keeping of the pupil's health sheet will be one of the chief duties of the school doctor. On this form he will enter the name and age of the child and the school which he attends, and then, if possible, records of previous illnesses. It is considered advisable to note previous infectious illnesses, as in case of epidemic this may prove a very important point. Hereditary antecedents are, however, omitted in order not to wound the susceptibilities of parents.

The object of the scholar's health sheet is not to form a collection of medical records, but to enumerate the illnesses from which the children are liable to suffer and to inform the parents when they should take precautionary measures to prevent their occurrence. On the sheet re-vaccinations and the results are also to be entered.

The school doctor has to examine the chief organs of the body, especially those of sight and hearing, and also the condition of the lungs.

In France a great movement was begun by the late Professor Grancher in favour of grappling with pulmonary tuberculosis in the initial stages of the disease. "Pre-tuberculous cases," as Professor Grancher called them, are numerous in the elementary schools of France. These cases are curable when taken in time, and it is for them that Professor Grancher advocated the establishment of open-air schools.

The medical inspector will also select and recommend children for the school colonies which have been formed in Paris and the large towns by the school councils, associations made obligatory in every Commune by the law of March 28th, 1882. These councils, maintained by subsidies from the State or the Commune, and also by private subscriptions, provide means for the attendance at the classes and distribute help in the shape of grants to poor children. It is they who organise the holiday colonies so popular in France. The members of the colonies are chosen by the school doctor from among the poor school children, and only those are selected whose health would benefit by a stay in the country. Any contagious subjects

and cases which might be a source of danger to the others are eliminated. For preference, convalescents from acute illnesses, the anæmic, feeble, the lymphatic with generalised glandular enlargements, and finally the pre-tuberculous are selected.

Certain school councils send the children to the seaside, to the hills, or to the country. On the doctor rests the responsibility of deciding which would be to the greatest advantage of the child.

Every school council being self-governing, each town and even each district acts as it thinks best. In Paris, for example, several wealthy districts have bought a large property in the country, and send their children there. Others rent a large house during the summer. Lastly, certain societies undertake what is called "boarding out." One or two children are sent to the home of a farmer to share the life of the country people. In this way the maximum of benefit it attained with the minimum of expense. The length of stay is usually three weeks. Some towns extend the time a little. Others arrange two series of country visits, one in August and the other in September. The town children are accompanied by masters or mistresses, who exercise supervision over them.

The Society of Medical Inspectors of Schools in Paris is urging that the school doctor may be held responsible for the superintendence of physical education in the school, and for the instruction of the teachers and pupils in hygiene, but as yet this is an unrealised wish.

What applies to Paris will shortly be true also of the large towns, and we shall soon see an organisation for the medical inspection of schools throughout the whole of France.

Further, a scheme for the organisation of medical inspection in all elementary schools has been laid before the Chamber of Deputies by the President of the Council of Ministers, and this will soon be discussed and voted upon.

The Inspection of Academies and Colleges.

In the colleges the question of medical inspection is

much more complicated. In those academies and colleges where there are residential pupils the examining school doctor is also the medical attendant. Nominated by the Minister on the recommendation of the headmaster, he visits the infirmary, examines the pupils who are brought to him, and treats those who are sick.

The need for the superintendence of physical development in the colleges, although not so urgent as in the elementary schools on account of the better class from which the pupils are drawn, is not less necessary.

For several years in most of the institutions for secondary education the residential pupils have been provided with a health memorandum, in which are entered every six months records of the measurements of weight, height, and chest circumference, together with notes on the state of the scholar's health and the illnesses experienced during the educational course. Some institutions have introduced most complete memoranda. In this respect one may instance l'Ecole Nationale Professionnelle d'Armentières (Nord), which is a model of its kind.

REFERENCES.

For full particulars regarding the system, methods, and results of medical inspection in France and the problems connected therewith, see the following special journals:—

L'Hygiène Scolaire. The official organ of the League of School Hygiene. Quarterly. Paris: Masson, 1903-1910. Frs.4 per annum.

La Médecine Scolaire. Organ of the "Société des Médecins inspecteurs des écoles de Paris et de la Seine." Monthly. Paris: Delagrave, 1908-1910. Frs.7.

"Conférences d'Hygiène Scolaire du Musée Pédagogique." Paris: Colin, 1909. Frs.3.90.

See also the following works:—

Blayac: "L'inspection hygiénique et médicale des Ecoles." Paris: Impr. Municipale, 1888.

Bunel: "L'Hygiène des Ecoles—Rapport au Conseil d'Hygiène de la Seine." Paris, 1893.

CORNET: "Rôle et nomination des médecins inspecteurs des Ecoles." 2me Cong. int. d'Hygiène Scolaire. Paris: Masson, 1905.

DUFESTEL, L.: "Hygiène Scolaire." Paris: Doin, 1909. Frs.5.

DUFESTEL, L.: "Guide Pratique du Médicin Inspecteur des Écoles." Paris: Doin, 1910. Frs.3.90.

GUIBERT: "Rapport au Conseil Municipal de Paris sur la réorganisation du Service de l'inspection médicale des Ecoles." Paris: 1908.

LABIT ET POLIN: "Hygiène Scolaire." 2 vols. Paris: Masson, 1896. Frs.10.

LEGENDRE, P.: "Rôle du Médecin Scolaire." 1er Congrès Français d'Hygiène Scolaire. Paris: Masson, 1903.

MANGENOT: "L'inspection médicale et hygiènique des Ecoles." Paris: Masson, 1887.

MANGENOT: "L'examen individuel et le bulletin sanitaire des écoliers." Rev. d'Hygiène. Paris, 1894.

MATHIEU, ALB.: "Carnet scolaire" in *Hygiène scolaire*, No. 18, 1908.

MERY, H.: "Méthode pour l'examen médical des écoliers." "Transactions Second International Congress on School Hygiene," vol. ii., p. 445. London: Royal Sanitary Institute, 1908. 5s.

MERY, H.: "Rapport sur l'inspection médicale des Ecoles françaises, 1er Congrès d'Hygiene scolaire." Paris: Masson, 1903.

MOSNY: "Le rôle du médecin scolaire," in *Hygiène scolaire*, No. 23, 1908.

ROUX, CÉSAR: "L'organisation de l'inspection médicale des Ecoles de la Ville de Nice." "Transactions Second International Congress on School Hygiene," vol. ii., p. 536. London: Royal Sanitary Institute, 1908. 5s.

TEISSIER: "Le livret sanitaire à l'école." "Congr. hyg. scol." Paris: Masson, 1906.

TRUC ET CHAVERNAC: "Hygiène ocul. et inspection oculistique des Ecoles." Paris: Maloine, 1908. Frs.3.

XXIX

MEDICAL EXAMINATION OF SCHOOLS AND SCHOLARS IN NORWAY

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THE Norwegian Education Act of 1896 provides that all public higher schools shall have a qualified doctor to conduct all necessary hygienic inspections. According to the Act of 1889 doctors may be appointed to National schools in towns, provided the municipal council meets the expense, and this is now arranged for in nearly every town in Norway. For country schools there is no regular medical inspection.

General medical practitioners are usually appointed to serve as the medical examiners. They act under the control of the School Board and are not responsible to the Board of Health.

ROUTINE OF THE NORWEGIAN SCHOOL DOCTOR.

The school doctor usually attends at the school every week, when the teachers present those pupils for examination whose state of health they suspect is not satisfactory. The doctor gives advice concerning the necessity for treatment, and suggests arrangement of school work, gymnastics, etc. Moreover, he has to examine all the new pupils entering the lowest class, and all the children sent to summer colonies have to be examined. It is also expected that the doctor shall from time to time inspect the methods

of manual training (*i.e.*, "slöid"), and see that writing, gymnastics, and other forms of educational and physical training are properly conducted.

It may be said that the development of our medical school service is still in its probationary period. A systematised method of reporting is not yet organised. Exact conclusion can not therefore be formulated. Many are desirous that there should be more frequent examinations of scholars in all classes. It is most desirable that systematical investigations should be conducted so as to provide reliable data regarding the prevalence of physical defects and the frequency of certain diseases. But an enlargement of work requires a higher salary for the doctor, and here practical difficulty arises.

It is to be remembered that medical supervision of the epidemic, venereal and tuberculous diseases is entirely in the hands of the medical officers of the Board of Health. The school doctor is not expected to deal with this class of case.

At present there are no official reports available on the medical school service of Norway.

In 1901, however, the year when the Tuberculous Diseases Act was put in force, the Board of Health of Kristiania arranged that all children in the national town schools appearing anæmic, suffering from coughs, or presenting symptoms suggestive of tuberculosis, were to be examined by the school doctors. The results from the eighteen schools were rather different, but for all the schools together it was found that 1.5 per cent. were the proceeds of some form or other of tuberculosis of the lungs, and 0.7 per cent. were cases of open phthisis. The total number of the scholars in the schools examined was about 23,500.

The efforts of the Board of Health in regard to the arrest of tuberculosis are greatly aided by the school doctors. Every open infectious case of tuberculosis must, according to the Act, be notified to the medical officer of health, and when the patient is not under the control of any private doctor, the officer has to see that

his home and other circumstances are suitably controlled. In Kristiania it is arranged that when school children are found to belong to a family in which a member is suffering from tuberculosis the school doctor is informed; he examines the children and sends a report to the medical officer, who in this way is very often enabled to take measures at a very early stage of the disease.

The Examination of Schools.

All school buildings and their appointments are under the control of the school board and the medical officer of health. The school doctor, however, is expected to give his opinion when asked or when any sanitary deficiency is discovered.

Conclusions.

The medical examinations of schools and scholars in Norway is still in its beginning. There is every reason to believe that very soon the medical school service will be enlarged and its scope extended.

In the training colleges for all classes of teachers lectures in school hygiene are now given, and the candidates have to pass an examination in the theory and practice of hygiene.

REFERENCES.

Such articles and works as are available are mostly in Norwegian, and so hardly likely to be of service to the general reader.

A list of Norwegian schools will be found in the State School Board's Report, edited every five years; see also the Annual Report of Kristiania School Board.

See also:—

"School Doctors and School Hygiene." Discussion in the Medical Society in Kristiania, 1900.

The following references may be of service:—

ANDVORD, K. F.: "Tuberculosis among Children in Norway" in "Tuberculosis in Infancy and Childhood." Edited by Dr. T. N. Kelynack. London: Baillière, Tindall and Cox, 1908. 12s. 6d. net.

BENTZEN, G. E.: Different articles in *Vor Ungdom* [*Our Youth*] and in *Universitets-og Skoleannaler* [*Annals for University and School*].

BERNER, HJ.: "Examinations of the National Schools of Kristiania," in the Annual Report of the Board of Health, 1891.

BERNER, HJ.: "Examinations of the Private Higher Schools in Kristiania," in the Annual Report of the Board of Health, 1901.

HENIE, C.: "School Doctor," different articles in *Skoletidende* [*The School Journal*].

HOLST, AXEL: "Skolehygiene." (Textbook for teachers.) Kristiania: H. Aschehong and Co., 1909.

MAGELSSEN, A.: "Headache in the Middle Schools." *Tidsskrift for Den norske lageforening*, 1904.

HOLST, AXEL: "Studien über Schulkopfweh," *Archiv für Hygiene*, vol. xli., pp. 256-300.

HOLST, AXEL: "Skolehygieniske undersögelser" ["School Examinations"]. *Tidsskrift for Den norske lageforening*, 1900.

XXX

MEDICAL EXAMINATION OF SCHOOLS AND SCHOLARS IN SWEDEN.

BY

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AND

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To a certain extent Sweden may claim to be regarded as a pioneer country in regard to the medical examination of schools and scholars. Mention is made of the appointment of special medical officers for this purpose as long ago as between 1830 and 1840, and in 1863 there was issued an ordinance prescribing the duties they were required to fulfil. It is fair to assume that as early as 1868 all the higher public secondary schools in the kingdom had medical officers attached to their staffs. The School Codes of 1878 and 1892 contained paragraphs which still further extended the sphere of activity in the school allotted to the medical officer. The Code at present in force bears date February 18th, 1905. It contains detailed prescriptions concerning the duties of school medical officers, drawn up entirely in accordance with modern principles of hygiene. The State Secondary Schools' Supervisory Board has the services of an expert in hygiene at its disposal, and he is consulted on matters belonging to the department of educational equipment.

On the staff of every school there now has to be a medical officer, appointed and remunerated by the Government.

Duties of a School Medical Officer in Sweden.

The school doctor is expected to examine candidates for entrance to the school free of charge, if they are in indigent circumstances. To obtain entrance into a school a candidate must present certificates to show that he or she has been vaccinated, and is free from any illness or defect which would produce unfitness for taking part in school work or might exercise a deleterious influence on schoolfellows. He has to carry out at the beginning of every term, in the presence of the teacher of gymnastics, a careful investigation of each one of the scholars, and to hand in to the headmaster or the class superintendent a report upon the result of such investigation. The pupils' sight and hearing are to be tested once every year. Where required, he must medically examine any pupil, either at the suggestion of the headmaster or otherwise, whenever the state of health seems to call for investigation.

At all times the school doctor must be ready to give the headmaster any advice that may be necessary in regard to any outbreak in the school of an infectious complaint, and direct measures to prevent spread of infection. A definite period of exclusion from school of all pupils who have contracted an infectious complaint is not prescribed by the School Code. In no case, however, is it permissible for a pupil who has had any such complaint to return to school until the school medical officer shall by certificate have declared him free from infection.

The school doctor has to attend indigent pupils in case of illness free of charge. This is not a new requirement; it has been in force as regards the public schools for a long time.

The school doctor has also to inspect all the buildings belonging to the school and to be present at the gymnastic classes at least once a month. In regard to the latter, attention has to be particularly directed to seeing that the

pupils are not required to carry out movements which are unsuited to their physical powers.

The school doctor has to spend at least one hour per week on the school premises for the purpose of being able to give advice to the headmaster, the masters, or the pupils, if such be needed. This prescribed hour is to be employed partly for receiving any members of the school community who desire or need to consult the doctor, and partly for inspecting the conditions under which the pupils do their work in the class-rooms: how they are seated as regards light and air, etc., how they sit, postures of body, etc., and what degree of mental alertness they display at their work and in their games.

The supervision of the school curriculum of work forms an important item. The chief point for the school doctor to notice is whether work and leisure are suitably appointed, so as to avoid the occurrence of overstrain among the pupils. If the medical officer finds cause to disapprove of the curriculum in any particular he should bring the fact to the notice of the headmaster. An annual report has to be prepared.

The school doctor has also to make sure, in case no other expert on hygienic matters is called in, that the claims of hygiene are duly and adequately observed when new buildings are being erected or old ones repaired and altered. He must be present at the staff meetings when questions concerning the health of the pupils or the sanitary arrangements at the school are being discussed. On such occasions he must take active part in the discussion and see that proper results are arrived at. Thus in hygienic matters the school medical officer is not only an advisory member of the staff; he is also empowered to assist in the framing of decisions.

Furthermore, the school medical officer has the duty of contributing to see that the prescriptions laid down respecting physical education and sanitary arrangements at the school are duly observed and carried out. Those prescriptions are briefly as follows: The school-house should be in a healthy situation, with plenty of space near

it for outdoor games; a so-called play-shed for resting or sheltering should be built on the outskirts of the playground. The rooms intended for teaching in, etc., are to be constructed in accordance with regulations issued specially in regard to them. The gymnasium is to have a changing-room, a douche, and a bath-room attached to it. Opportunities should be provided during the summer for the pupils to receive instruction in swimming. With regard to the heating, ventilating, lighting, and cleaning of the various rooms, lobbies, etc., in the school buildings, the headmaster is expected to draw up, in consultation with the school medical officer, a detailed plan of procedure to be scrupulously followed out by those whom it concerns. A copy of the plan of procedure is nailed up on the wall in some suitable place in the school building. To each pupil being taught in a school-room there should be allotted about six cubic metres of space and one-and-a-half square metres of floor area. The pupils' desks should vary in size to accommodate the varying sizes of the pupils. Shortsighted and deaf pupils are to have suitable places assigned to them by the school medical officer. Text-books, etc., are to be printed in a type which is sufficiently large and clear to preclude any danger of the sight of the pupils being injured in the use of them.

The school medical officer is not required to do any teaching under the present school code in Sweden.

Any duly qualified doctor may apply for and obtain the appointment of school medical officer. It has not been considered essential that he shall have gone through a special course in school hygiene, inasmuch as instruction in hygiene forms part of the course of study which all medical students take up when preparing for their qualifying degree.

Concerning secondary schools a royal enactment enjoins that in order to obtain a government grant they should certify that the arrangements in the school are, as regards hygiene, satisfactory and the instruction so organised that the pupils are not overexerted. Besides, they shall prove that a certificated physician is attached to the school. In

applying for a goverment grant an account of the size and quality of the localities used for the school shall follow. Consequently there are as a rule medical officers appointed to most Swedish girls' schools.

Medical Examination in Public Elementary Schools.

Concerning public elementary schools the medical supervision is of a recent date. The beginning was made in Gothenburg in 1895, later on Stockholm and other cities have followed this example. At present there are school medical officers appointed at the public elementary schools in all the greater cities and in a number of the country communities. Medical treatment in school polyclinics or in other ways is given in Stockholm, Lund, Malmö, Hälsingborg, etc. Treatment of the teeth is provided in Stockholm, Jönköping, Örebro, Uppsala, Linköping, etc. As regards the duties of school doctors in the different places, as yet there are no uniform rules. As typical of the most developed, the following account of the Stockholm public elementary school physicians will serve:

In the year 1899 there were appointed for the first time in connection with the public elementary schools in Stockholm several medical officers whose prescribed duty it was to test and examine the children with regard to their physical health and mental condition. The number then appointed was three, but in 1901 another was added and also a specialist in eye diseases and two specialists in diseases of the ears, nose, and throat. In 1903 the number of these medical officers was increased to eight, making one each for the eight territorial parishes; their title became henceforth "School-Physician." There was another specialist in diseases of the ears, throat and nose added at the same time. In 1906 "polyclinical surgeries and dispensaries" were established at the several schools, for the provision of gratuitous treatment for invalid children and for the supply of medicine free of charge to those in needy circumstances. In the same year the Stockholm City Council voted a sum of 3,000 kronor

(£165) to be devoted to such investigations in the department of school hygiene as cannot be considered as falling within the scope of the school medical officers' duties. Out of that amount a grant of 1,800 kronor (£99) was made to Dr. C. Sundell to enable him to carry out investigations respecting the air in school-rooms as affected by the systems of heating and ventilation in vogue. Another grant of 1,000 kronor (£56) was made to Dr. J. Hammar that he might inquire into the phenomenon of fatigue as a resultant of various forms of school work, with a view to being able, on the basis of his results, to devise a curriculum that should avoid all danger of overstrain for the pupils. A third grant of 200 kronor (£11) was made to Dr. K. Söderling for the purposes of an inquiry into the positions occupied by the children when sitting at their school desks, primarily with the idea of discovering which is to be preferred, the upright or the sloping style of writing. The budget for 1907 accepted by the Stockholm City Council included the following two items: A grant of 6,200 kronor (£341) for the establishment of a dental surgery for public elementary school children, and another of 5,000 kronor (£275) for investigations relating to school hygiene. Out of the latter sum, 1,500 kronor £88 10s.) were allotted to Dr. C. Sundell for the purposes of a thorough and careful investigation of physically delicate children of school age, more especially such as suffer from poorness of blood, and of the conditions in which they live, their homes, etc., with a view to discovering the causes of the prevalent general debility among such children and the devising of some means for its removal. A sum of 1,500 kronor (£88 10s.) was further granted to Dr. J. Hammar for the continuation of his inquiries into the problem of fatigue, and a grant of 2,000 kronor (£110) was made to Dr. K. Söderling to enable him to make experimental tests regarding the conditions prevailing as to lighting by natural means the class-rooms in the public elementary schools and to inquire into and report upon the subject of the most suitable sizes for school children's desks. The total sum

to be spent in 1910 by the City of Stockholm on medical supervision of public elementary school children is 21,300 kronor (£1,183), besides the grants above-mentioned of 5,000 kronor for investigation relative to school hygiene and 6,700 kronor for a dental surgery.

The Instructions respecting the Duties of School Medical Officers, issued in 1903, show among other things that the following are incumbent upon a school physician:—

1. *Each term thoroughly to examine all the children attending the 1st, 7th, and 12th courses of instruction (i.e., in their 1st, 4th, and 6th years at school)* with respect to the development of their bodies and the state of their health; furthermore, *to examine also other children who may be reported by the head teacher as requiring medical inspection*, and to examine medically those children who have been recommended as fitting candidates for places in a "vacation colony" and to test them again on their return.

2. On lists, giving names and dates of birth of the children examined, to enter such information as may be necessary regarding the children's state of health and condition of body, together with particulars as to height, weight, and chest measurement, as well as a statement as to whether the child examined should be allowed exemption from gymnastics and physical exercises, and further to hand in to the proper teacher who has charge of the child a prescription as to the treatment he or she should have, if any special management should be necessary.

3. In a special report to state the result of the examination of the children selected to join a vacation colony.

4. In case of any outbreak of infectious disease to announce the fact to the head teacher and to go to the school and adopt such measures as may be advisable for preventing the spread of the infection.

5. To pay careful attention to the hygienic conditions at the school, more especially with respect to cleanliness, ventilation, heating, and lighting, and to furnish the Elementary Schools' Supervisory Board and the School

Managing Committee with advice and information on these particular subjects.

6. To be present at the meetings of the Schoo Managing Committee on being summoned to attend by the chairman of that committee when he considers it necessary.

The aural specialist is required to examine every child in the second course at the commencement of each school term and also all of the newcomers in the higher courses, provided they have not previously attended any public elementary school. He must also examine all children who are sent to him during term-time by the ordinary medical officer or by the head teacher for special treatment of ears, nose, or throat.

The eye specialist is required to examine all the children sent to him to be tested with regard to eyesight by either the school medical officer or the head teacher. He must also give advice as to remedies for short-sightedness.

Every medical officer attached to a school is furthermore under obligation :—

1. To be present for the medical examination of any children who may be sent to him for that purpose at such time and place as may be agreed upon between himself and the head teacher; and

2. To hand before the expiration of the month of January every year to the School Board a written report of the work done during the preceding year, together with such remarks and suggestions as he may see reason to make on the strength of the experience he has gained.

Since the above Instructions were promulgated there have been added the following duties to those which devolve on a school medical officer :—

1. To examine, in conjunction with the head teacher, any children who may be backward in mental development.

2. To examine, every term, such children as are affected with tuberculous disease of the lungs and to isolate such cases, so that they may be taught separately.

3. To examine at the beginning and close of every term pupils belonging to the school bands of music.

4. To arrange one hour every week for receiving and treating in the school polyclinic such children as are suffering from internal disease of any kind.

Nowadays it is customary for records to be kept regarding the children's bodily health and general condition. They appear in the so-called catalogue lists of the scholars as printed forms with columns in which are inserted marks of proficiency, etc. These lists the children retain throughout their school course. A special record book is kept in which notes are made respecting the children who receive treatment in the school polyclinic.

REFERENCES.

The following reports should be consulted:—

"Öfverstyerelsens för Stockholm's stads folkskolor Berättelse åren 1899-1908." Stockholm's folkskolors handlingar. [Report of Stockholm Public Elementary Schools' Supervisory Board; see specially the articles Läkareundersökningar.] Published by the Supervisory Board, 1899-1908.

"Education in Sweden, with special reference to Hygienic Conditions." Report prepared by the Royal Swedish Committee for the Second International Congress on School Hygiene. London, 1907.

"The State Secondary Schools Supervisory Board: Standard Regulations respecting School Buildings for Public Secondary Schools in Sweden." Published by Committee for London International Congress on School Hygiene, 1907.

Förhandlingar vid Skolläkarmötet i Stockholm, den 13, 14, 15 April, 1908. [A Report of the Conference of School Medical Officers by the Public Secondary Schools.] Hygienisk Tidskrift, 1908: 2 and 3. Stockholm, 1908.

Almquist, E.: "Förenklad Luftväxling i Skolrum." [Simplified Ventilation in School-rooms.] Hygienisk Tidskrift, 1908: 1.

ALMQUIST, E.: "Allmän Helsovårdslära." [Handbook of Common Hygiene.] Stockholm: Norstadt and Sons, 1897.

ALMQUIST, E.: "Hälsorvårdslärans framsteg." [The Progress of Hygiene.] Stockholm, 1902.

ALMQUIST, E.: "Lärobok: Skolhygien." [Handbook in School Hygiene.] Stockholm: Norstadt and Sons, 1896. 1 kronor.

BERGQUIST, J.: "Massnahmen zur Verhütung und Bekämpfung der Tuberkulose in den höheren öffentlichen Lehranstalten Schwedens. Published in the Report of the International Tuberculosis Conference in Stockholm, 1909.

BRATT, T.: "Den Offentliga Barnbespisningens Samhälleliga Betydelse." [The Social Importance of the Public Feeding of Children.] Svenska Nationalföreningens mot tuberkulos Kvartalskrift, 1910: 1. 0.50 kronor.

DAHLGREN, W.: "Berättelse öfver inspektionen af Uppvärmnings och Luftvexlings Anordningarna vid Stockholm's folkskolor." [On Ventilation and Heating.] Stockholm's folkskolors Berättelse, 1897.

DAHLGREN, W.: "Undersökningar rörande Luftens Fuktighetshalt uti Folkskolorna." [Examinations on the percentage of Humidity of the Air in the Public Elementary Schools.] Stockholm's Folkskolors Berättelse, 1899.

DOVESTIE, G. H.: "Om helsotillståndat i Kristianstads folkskolor." [On the condition of health in the Public Elementary Schools of Kristianstad.] *Hygiea*, part 3, 1895.

DOVESTIE, G. H.: "Våra folkskolelokalus Ceskaffinhat i hygieniskt hänseende." [The Hygienic Condition of the Public Elementary Schools' Localities.] *Hygiea*, part 4, 1895.

FJELLANDER, G.: "I hvad mån inverkar skolans afstånd från hemmet på skolbarnens närngstillstånd?" [The Influence of the Distance to the School on the Nutrition of the School Children.] Hygienisk Tidskrift, 1909: 4. Stockholm.

FLODEMS, B.: "Om batydelsen of hyuplastiska och tuberkulosa processai i farynxtonsillen." [On the import

of hyperplastic and tuberculous processes in the pharynx-tonsill.] Isaac Marcus' Coht. akt. Colag. Stockholm, 1902.

HAMMARLUND, E.: "Folkskolekalender, 1908-10." [Calender of the Public Elementary Schools.] Stockholm: Sversk Läraretidnings förlagsaktiebolag. 1.50 kronor.

HARTELIUS, J. S. W.: "Undersöknigar vid Arboga Folkskolor." [Examinations of the Children by the Public Elementary Schools of Arboga.] *Hygiea*, Februari, 1902.

HELLSTRÖM, G.: "Undersökning öfver efterblifna skolbarn." [Examinations of School Children mentally left behind.] Nyt tidskrift for abnormvœsendet, 9d. hœfte. Köberhavn, 1899.

KEY, AXEL: "Om pubertetsutvecklingen och dess förhållande till Sjurkligheten hos Skolungdomen." [The Development of Puberty and its relation to the Ill-health of the School Children.] Nordiskt medicinskt arkiv. Stockholm, 1891. Häft 1 and 2.

LAGERARANTZ, E.: "Folkskoleförfaningar för Stockholm. [The Statutes for the Stockholm Public Elementary Schools.] Stockholm: Norstedt and Sons, 1904. 2 kronor.

LENHARDTSON, A.: "Folkskoletandkliniken." (Dental Clinic in the Public Elementary Schools of Stockholm.) Stockholm's folkskolors handlingar, 1909.

LUNDBERG, M., KJELLIN, G., OCH KARLSSON, A.: "Enquête sur la fréquence de la tuberculose pulmonaire dans les écoles primaires de Stockholm." Reported by Sture Carlsson to the International Tuberculosis Conference in Stockholm, 1909.

SÖDERLING, K.: "Barnens Sittställning vid Skrivarbetet." [The Position of Sitting by the Labour of Writing.] Stockholm's folkskolors handlingar, 1907: 2.

STANGENBERG, E.: "Bidrag tiu kännedomen om hillståndet hos våra skolbarns hörselorgan, näsa och svaeg. [Contributions to Knowledge of the Ear, Nose, and Throat of the School Children.] *Hygiea*, part 3, 1894.

STE'ENHOFF, G.: "Bidrag tiu kännedomen om vår

folkskolehygien." [Contribution to the Knowledge of the Hygiene in the Public Elementary Schools.] *Hygiea*, Augusti, 1900.

SUNDELL, C.: "Undersökningar af Blodfattiga Folkskolebarn." [Examination of Anæmic Children in the Public Elementary Schools of Stockholm.] Stockholm's Folkskolors Handlingar, 1909, part 2.

SUNDELL, C.: "Report of Investigations regarding the Ventilation and Heating of the Stockholm Public Elementary Schools in 1906." Published by the Royal Swedish Committee for the Second International Congress of School Hygiene in London, 1907.

SUNDELL, C.: "Fortsatta Undersökningar af Blodfattiga Folkskolebarn." Hygienisk Tidskrift, 1909: 3. Stockholm.

TÖRNELL, G.: "Om Skolläkare." [On School Medical Officers.] Stockholm: Norstedt and Sons, 1905. 2 kronor.

TROLI-PETERSON, GERDA: "Pettersson-Palmquist's Kohlensäureapparat modificirt für Ventilations Untersuchungen, Zeitschrift für Hygiene und Infektions Krankheiten," Band 26, 1897.

WIDMARK, J.: "Aftagandet af Närsyntheten i de Högre Allmänna laroverken." [The Decrease of Myopia in the Public Secondary Schools of Sweden.] Hygienisk Tidskrift, 1909: 1. Stockholm.

XXXI

MEDICAL EXAMINATION OF SCHOOLS AND SCHOLARS IN DENMARK

BY

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ALTHOUGH educational procedures have been highly elaborated in Denmark, no law as yet has been passed providing for the compulsory inspection of schools or the systematic medical examination of scholars.

It is true that medical officers of health both in urban and rural districts are entitled to enter all schools where conditions inimical to health may be expected. As a matter of fact, however, such investigation is generally limited to an inquiry respecting the outbreak of infectious disease.

There is no general Medical School Service in Denmark. Most of the secondary and higher grade schools are under private management; in some few of these medical inspection has been arranged for.

The adoption of the Tuberculosis Act of 1905 has led to the issue of regulations directing the systematic cleansing of all State-managed schools. Directions are sent out by the Minister of Education; and the local educational

authority and the principal of the school are responsible for the carrying out of the same. The same Act also provides powers whereby the local health authority is enabled to control conditions as to cleanliness in private schools.

The only centres where regular medical inspection is in force are (1) the Municipal Board schools (elementary and secondary) of Copenhagen; (2) the public schools of the neighbouring town of Frederiksberg; (3) elementary schools in the large provincial towns; and (4) some few parochial schools in rural districts near to the capital. In all cases medical inspection has been initiated purely under voluntary conditions.

Copenhagen very properly led the way. In 1896 the first medical inspectors were appointed. Within a few years all the scholars in the Municipal schools of the city were subjected to medical examination. The model for procedure is that generally known as "the Wiesbaden system." The school doctor is expected to visit the schools under his charge at least once every fortnight. All scholars selected by the teachers as being in any way abnormal, weak, diseased, or even suspected of ill-health, are submitted to examination. A written report is sent to the parents of children requiring treatment. Neglected and verminous children are looked after by the school nurses. The medical inspector is expected to visit the various class-rooms from time to time and advise regarding the sanitary conditions. Each scholar is examined soon after admission to the school, and a case paper is filled in giving particulars as to physical characters.

The school doctor is expected to advise the principal and his staff in all matters relating to the sanitation of the school as well as the health of the scholars.

Unfortunately the work of the school doctor is hampered by his having to take charge of too large a number of children—often from 2,000 to 4,000.

In Frederiksberg, a large centre adjacent to Copenhagen, there is one medical inspector for all the Municipal schools, with about 8,000 scholars, but he is not permitted to have any other medical work.

REFERENCES.

The following works and official Reports will be of service for reference:—

The Tuberculosis Act, April 14th, 1905.

Circulars relating to cleaning of the schools, issued by the Ministry of Education, June 26th, 1905.

Regulations concerning the cleaning of schools, issued by the Ministry of Education, November 2nd, 1905.

HERTEL, AXEL: "Schulhygieinische Vondenften un Dänemark." *Internat. Arc. f. Schylhyg.*, Band II., p. 330, 1906.

HERTZ, POUL: "Die Schulhygienischen Verhältnisse in Copenhagen," *Weyl*, Die Association von Kobenhavn. Leipzig: Engelmann, 1905.

INGERSLEV: "Das Schulartswesen un Dänemark." *Internat. Arch. f. Schylhyg.*, Band I., p. 123, 1905.

XXXII

MEDICAL EXAMINATION OF SCHOOLS AND SCHOLARS IN SWITZERLAND.[1]

BY

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Generally speaking, school hygiene is not a recent development in Switzerland. Some of the cantons, indeed, can boast of a remarkably well-matured system of school medical supervision; but there are also some few cantons where such supervision is still in its infancy.

Hygienic school supervision may be developed along two distinct lines. It may concentrate its attention primarily on the sanitary control over the school buildings and the enclosed spaces, the school fittings, etc., this supervision being carried to the length of directing the planning and equipment of new school structures; or it may make the health conditions of the scholars its main object.

The sanitary control over school buildings has, to a large extent, received proper consideration in the various enactments and regulations which have been issued by the cantons of Switzerland, taking them altogether. The medical examination of the scholars, on the other hand, has not as yet met with that degree of attention to which the seriousness of the matter entitles it.

It is as well to mention here that our school medical inspection system has not been incorporated with public

[1] We are indebted to the kindness and skill of Mrs. Emilia V. Kanthack de Voss for the excellent English translation of Dr. Rudolf Schwab's interesting chapter.—EDITOR.

health administration, but has been organised by, and is entirely under the authority of the Education Committees, with the single exception of Geneva.

Sanitary Supervision of Schools.

The position with regard to the examination of our schools in Switzerland may be briefly stated. This examination embraces the school building and the entire premises; the classrooms, their cleanliness, illumination, heating, and ventilation, etc.; the sanitary conveniences; and, in fact, every detail that can influence the hygienic condition of the school. In the case of proposed new schools the suitability of the selected site and immediate surroundings come under scrutiny from a sanitary point of view. As far as the schools themselves are concerned, school hygiene has been developed with much thoroughness almost throughout the country. The larger municipalities have issued regulations on this point which may be regarded as satisfactory working models.

The Medical Examination of Scholars.

The initiatory step in the medical inspection of school children took the form of an official "recommendation," which was addressed to the Education Committees, and which was issued by the Federal Local Government Board, incorporating the Federal Statistical Bureau. This order was designed to empower the teachers to institute a general inspection of the scholars' hygienic condition. Where the circumstances permitted such a proceeding, this inspection was to be carried out by a medical man. A schedule was drawn up by the Federal Local Government Board for this purpose, which, after being duly filled in, was to be returned to the Federal Statistical Bureau.

The medical examination of the scholars concerns itself chiefly with the following points: The discovery of defects of vision or of hearing, or any other physical defects; the detection of children with constitutional debility or mental deficiency.

A summary of the results of medical inspection in twenty-one cantons in 1907 of children who had attained school age, gave the following figures:—

Defective children	7,695
Mental defectives—	
Idiots	41
Slightly feeble-minded	535
Markedly feeble-minded	144
Physical defectives—	
Defective hearing	899
Defective speech	791
Defective sight	2.792
Nervous disorders	52
Other diseases	2,398
Moral defectives	43

The systematic examination of school entrants and of school children has, however, only been established in a few cantons, including Zürich, Lucerne, Schwyz, Friburg, Ticino, Valais, Neuchatel, and Geneva. These have all issued official cantonal enactments or regulations dealing with the matter. In canton St. Gallen, certain individual municipalities have introduced systematic medical examination of school children, and have drawn up precise regulations on the subject. In the cantons Aargau and Vaud the same is the case as regards their chief towns, Aarau and Lausanne.

The Duties of the School Doctor.

The office of school doctor has also become a recognised institution in Switzerland, though at first only the town communities enjoyed the benefit of his services. Zürich and some rural parishes in the canton of Zürich, Lucerne, Basel, Rohrschach, Aarau, Chur, Lausanne, Yverdon, Montreux, Neuchâtel, La Chaux-de-Fonds, and Le Locle are all supplied with school doctors.

The duties of the school medical officer are as follows:

(*a*) The periodical examination of the school premises, and of the internal arrangements with regard to cleanliness, heating, ventilation, illumination, etc.

(*b*) The inspection of seats and desks.

(*c*) The examination of entrants (ears, eyes, physical and mental development), and re-examination at later periods.

(*d*) Medical control over school absentees.

(*e*) Examination of children suffering from disease or presenting pathological appearances.

(*f*) Critical inspection of the posture and carriage, physical exercises, games, nutrition, and clothing of the children, the granting of special holidays during intense heat, etc.

In Zürich, at the beginning of the school year 1908-9, 3,606 of the 3,652 entrants were examined.

Of these, the following were rejected:—

District.	Boys.	Girls.	Total.
I.	15	24	39
II.	6	10	16
III.	76	67	143
IV.	17	21	38
V.	29	23	52
	143	145	288=7.8%

The conditions tabulated below accounted for these rejections:—

(*a*) Mental defects—

	Boys.	Girls.	Total.
1. Idiocy	1	—	—
2. Mental deficiency	4	5	9
3. Mental backwardness ...	30	20	50
(*b*) Physical defects—			
1. Defective hearing	—	4	4
2. Defective speech	1	—	1
3. Defective sight	5	2	7
4. Nervous disorders	5	5	10
5. Bad development and bodily defects	94	108	202

(*c*) Other causes (change of school in mid-term, foreign language, etc.)	3	1	4
	143	145	288

(*a*) *Examination of Eyes.*—Of the 1,191 children who were selected for special examination at the preliminary inspection, 1,078 attended. Of these, 797 (363 boys and 434 girls), or 22.1 per cent. of those selected, were shown to have defective eyes.

(*b*) *Examination of Ears.*—Of the 322 reserved for special examination, 301 attended and 300 (160 boys and 140 girls), or 8.3 per cent., proved to be abnormal in point of hearing.

Dental Conditions.—Of 3,352 children examined, only 45 showed a perfectly sound set of teeth.

In 1908, 915 cases of infectious disease were notified. As a consequence of this notification, 1,462 children were for a time excluded from school.

During the last few years Lucerne can also boast of an admirably organised system of school medical examination. The examination of school entrants takes place immediately after the commencement of the school year and is conducted by school doctors.

The results of this examination in 1908-09 are summarised as follows:—

	Boys.	Girls.
School medical examinations ...	407	365
Private medical examinations ...	6	2
Kept under medical supervision ...	33	58
Referred to eye specialist	52	78
Referred to ear specialist	7	14
Scoliotic	11	13
Vaccinated	62	107

In addition to the school medical inspection the authorities in Lucerne have also instituted a school clinic and a school dental clinic, which are well attended. One

hundred and ninety-seven medical visits were recorded in the school clinic for the year 1908-9, and 2,666 "consultations." The school dental clinic registers for the same year 3,443 attendances.

In the town and canton of Geneva the hygienic supervision of the schools is under the Cantonal Board of Hygiene. The School Medical Service is allotted to twenty school doctors, with a chief school medical officer at the head; eight are reserved for municipal districts and twelve for the forty-three rural parishes, the service dealing both with elementary schools and infants' schools. There are four additional officers appointed, including an eye specialist, two specialists for nose, throat, and ear, and a fourth for dental examinations. The last-named officer, who is the President of the Odontological Society of Geneva, is authorised to avail himself of the services of all the dentists who are members of this society in order to cope with the enormous amount of work that urgently calls for attention. Geneva has recently followed the example of other towns which enjoy a school medical service in providing a health schedule for each scholar. This is called the "Scholar's Sanitary Record" (*Carnet sanitaire des écoliers*), but is not, as in other localities, placed in the hands of the scholars or teachers but is deposited with the Board of Hygiene. This arrangement gives the relatives of the children the assurance that the findings of the physical examination are treated with professional secrecy.

Results of Medical Examination.

As regards the results of school medical examination, the experience of the town of Geneva for the year 1908-9 may be cited as an example.

In the elementary schools (excluding the infants' schools) out of a total of 309 classes, including 9,101 children, 297 classes were medically inspected, the inspections being conducted as follows:—

The 297 classes were submitted to a general physical

examination; in 172 the eyes were examined, in 104 the teeth, and in 88 throat, nose, and ear examinations were undertaken. A total of 7,912 children were examined by the school doctors, and of these 4,716 were referred to an eye specialist, 2,654 to a dentist, and 2,312 to a throat, nose, and ear specialist.

TABLE INDICATING THE RESULTS OF THE MEDICAL EXAMINATION OF SCHOOL CHILDREN IN GENEVA. RESULTS EXPRESSED IN PERCENTAGES.

	Sixth & Fifth School Year. Ages, 11-14.	Fourth & Third School Year. Ages, 9-11.	Second & First School Year. Ages, 7-9.
General Health—			
General condition, good ...	81	72	63
General condition, medium ...	19	28	37
Recommended for medical advice	3	7	11
Presenting signs suggestive of tuberculosis	—	2	5
Mentally deficient	3	6	5
Lateral curvature, scoliosis, etc.	2	4	6
Examination of Eyes—			
Normal sight	51	52	65
Almost normal sight, inflammatory conditions	27	33	21
Defective sight	22	15	14
Examination of ears, nose, and throat—			
Normal	82	73	67
Referred to specialist	15	17	26
Examination of teeth—			
Sound set of teeth	12	12	4
Noted	88	88	86
Treatment necessary	39	50	55
Treatment urgent	46	32	20

In conclusion, mention must be made of the Swiss Society for School Hygiene, which, under the broad-minded and energetic leadership of the President, Dr.

J. F. Schmid, Director of the Swiss Sanitary Office in Berne, assisted by the Secretary, Dr. F. Zollinger, Secretary of Education in the Canton of Zürich, has so successfully promoted the introduction of school medical inspection and advanced the interests of school hygiene in Switzerland. The society includes at the present moment 727 members, and publishes, in addition to a school hygiene journal,[1] a Year-book which has already attained its tenth issue and which holds the first place as a source of information with regard to all matters affecting school hygiene in Switzerland.

REFERENCES.

"Rapports de la Direction des Ecoles de Lausanne (Rapports du Médecin des Ecoles)," 1886-1908. Lausanne: Victor Fatio.

"Anleitung für das Lehrpersonal, um die in das Alter der Schulpflicht getretenen Kinder auf das Vorhandensein geistiger oder körperlicher Gebrechen zu untersuchen." Publié par le Département de l'Instruction publique. im Jahre 1900.

See also "Jahrbuch der Schweizerischen Gesellschaft für Schulgesundheitspflege." Vols. I.-X., 1900-9. Zürich: Zürcher & Furrer. Price of Vols. I. to VI., 7 francs; subsequent vols., 10 francs.

"L'Hygiène Scolaire dans le Canton de Neuchâtel." Publié par le Département de l'Instruction publique. Neuchâtel: A. Borel, 1906. 1.50 francs.

CARRIERE, H.: "L'Hygiène publique en Suisse; Rapport réstigé d'après les documents du Bureau Sanitaire Fédéral," extrait de "L'Inventaire des Institutions economiques et sociales de la Suisse à la fin du XIX^me siècle." Genève: Romet, 1900.

CARRIERE, H.: "Tuberculosis among Children in

[1] "Schweizerische Blätter für Schulgesundheitspflege und Kinderschutz" [*Swiss Journal of School Hygiene and Child Protection.*]

Switzerland," in "Tuberculosis in Infancy and Childhood." Edited by Dr. T. N. Kelynack. London: Bailliere, Tindal and Cox, 1908. 12s. 6d. net.

CLERC, E.: "Le Médecin des Ecoles." La Chaux-de-Fonds.

COMBE, A.: "L'hygiène scolaire en Suisse." Rapport présenté au Conseil Fédéral. Lausanne: Viret-Gentin, 1898.

EPERON: "Enquête sur l'Etat des Yeux dans les Ecoles de Lausanne." Lausanne: F. Rouge, 1892. 1.25 francs.

OST: "Die Frage der Schulhygiene in der Stadt Bern." Berne: Schmid, Francke & Co., 1889. 2 francs.

PFLÜGER: "Die Augen der Luzerner Schulkinder und die Luzerner Schulhäuser." Lucerne.

STOCKER: "Die Augen der Schülerinnen der Stadtschulen von Luzern." Lucerne: J. Burkhardt, 1896.

SULZER: "De la Myopie dans les Ecoles de Genève."

SCHMID, F.: "Die Schulhygiene in der Schweiz." Ed. by Dr. R. Wehmer: "Enzyklopädisches Handbuch der Schulhygiene," p. 772 (contains fairly complete bibliography). Leipzig & Vienna: Pichlers, Witwe & Sohn, 1903. 25 marks.

SCHMID, F.: "Die Schulhygienischen Vorschriften in der Schweiz, auf Anfang 1902 zusammengestellt." Zürich: Zürcher & Furrer, 1902. 7 francs. (A continuation of this, the second volume, entitled "Die Schulhygienischen Vorschriften in der Schweiz, 1902-1909," is to be published immediately.)

SCHMID, F.: "Gesundheitswesen." Vols. I. & II. File V. (8) of the "Bibliographie der Schweizerischen Landeskunde," (contains an exhaustive bibliography). Berne: K. I. Wyss, 1898-1906. 11 francs.

ZOLLINGER, F.: "Bestrebungen auf dem Gebiete der Schulgesundheitspflege und des Kinderschutzes." Zürich: Artistisches Institut Orell Füssli, 1902. 6 francs.

The following are reprints from the Year-book of the

Swiss Society for School Hygiene (Jahrbuch der Schweizerischen Gesellschaft für Schulgesundheitspflege). Zürich: Zürcher & Furrer:—

Bourguin-Lindt: "Enquête sur le surmenage dans les écoles secondaires et particulièrement dans les écoles supérieures de la Suisse," 1909.

Cristiani, H., et Rilliet, F.: "La Visite sanitaire des écoliers dans le Canton de Genève," 1909.

Henggeler, A.: "Schulhygiene in Rohrschach," 1907.

Henggeler, A.: "Schulhygienische Streifzüge," 1909.

Zollinger, F.: "Uebersicht über die Schulhygienischen Bestrebungen und Publikationen in der Schweiz im Jahre 1904," 1905.

See also "Schweizerische Blätter für Schulgesundheitspflege und Kinderschutz." Supplement to the *Schweizerische Lehrerzeitung* (Swiss Teacher's Journal). Zürich: Artistisches Institut Orell Füssli. Yearly volume in ten parts, 2.20 francs; foreign subscribers, 2.50 francs.

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